

Body Contouring

The BODY-Q Belly Button Scale: A Development and Validation Study

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Abstract

Background: One of the critical steps in abdominoplasty or in reconstructive procedures involving abdominal tissue involves repositioning the belly button. However, there is limited knowledge about patient satisfaction regarding the appearance of the belly button after such procedures. Currently, there is no standardized patient-reported outcome measure designed to assess this outcome.

Objectives: This study aimed to develop and validate a BODY-Q scale that measures patient satisfaction with the appearance of the belly button.

Methods: In Phase 1 (qualitative), patient interview data were used to develop and refine the new BODY-Q scale. In Phase 2 (quantitative), the scale was field-tested through a crowdsourcing platform. Rasch measurement theory analysis was used for item reduction and to examine reliability and validity. Predefined hypotheses were tested by applying a 75% acceptance threshold, which was considered indicative of sufficient evidence for construct validity.

Results: The BODY-Q Belly Button scale was refined through qualitative input from 5 patients. Psychometric validation was performed in a sample of 372 participants. Out of the 15 items assessed, 6 were retained in the final scale. This scale showed ordered thresholds, and the data fit the Rasch model ($\chi^2 = 22.72$, $df = 24$, $P\text{-value} = .54$). The scale evidenced reliability, with Person Separation Index and Cronbach α values $\geq .81$. For construct validity, acceptance of hypotheses was 89%.

Conclusions: The BODY-Q Belly Button scale can be used in clinical practice and in research to assess satisfaction with the belly button from the patient's perspective.

Level of Evidence: 4 (Risk)

Abdominoplasty has consistently ranked among the most widely performed aesthetic surgical procedures. According to The Aesthetic Society, in 2023, over 1.1 million abdominoplasties were performed worldwide.¹ During this procedure, the umbilicus, also known as the belly button, is transposed within the abdominal skin flap. The repositioning of the belly button is also a necessary aspect of procedures involving autologous breast reconstruction through the use of abdominal tissue, such as transverse rectus abdominis myocutaneous flaps or deep inferior epigastric perforator flaps.^{2,3} Despite the seemingly minor nature of umbilicoplasty within these procedures, the appearance of the belly button is crucial in achieving the most desirable cosmetic outcome.

The belly button represents the central focus and an essential aesthetic component of the abdominal wall.⁴ The position, size, shape, and depth of the belly button significantly contribute to the natural

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contouring and overall aesthetic appearance of the abdomen.^{5,6} Many plastic surgeons deem the belly button to be an aesthetic subunit in its own right.⁷⁻⁹ The ultimate appearance of the belly button can significantly impact patient satisfaction with their abdominoplasty, and a suboptimal outcome can negate the success of the procedure.¹⁰⁻¹²

There is currently no standardized patient-reported outcome measure (PROM) available to assess satisfaction with the appearance of the belly button after abdominoplasty or reconstructive procedures involving abdominal tissue.⁹ To address this gap, a BODY-Q scale was developed to measure patient satisfaction with the appearance of the belly button. The BODY-Q is a PROM specifically designed for individuals who are living with obesity and undergo weight loss, as well as those seeking body contouring for aesthetic reasons.¹³ The latest literature reviews have shown that this PROM evidenced the highest psychometric rigor among PROMs designed for use with patients undergoing weight loss and body contouring surgery.^{14,15} Comprised of multiple independently functioning scales, the BODY-Q employs a modular approach to assess various aspects of appearance, health-related quality of life (HRQL), and the patient's experience of care.¹⁶⁻¹⁹ This modular design facilitates the incorporation of new scales into the BODY-Q, enabling the measurement of additional concepts of interest. As such, this study aimed to develop and validate a new BODY-Q scale designed specifically for evaluating the appearance of the belly button.

METHODS

In our previous reports, we detailed the multiphase mixed-methods study utilized to create and field-test the BODY-Q scales.^{20,21} The qualitative phase of the study involved conducting and analyzing 63 concept elicitation interviews to identify important patient concepts. The resulting analysis led to the development of a conceptual framework and 22 BODY-Q scales/checklists.¹³ Subsequently, we augmented the BODY-Q with chest and obesity modules and by creating additional scales to measure the appearance of décolletage, stretch marks, and cellulite. The results of these scales are published elsewhere.^{17-19,22,23}

Qualitative Phase

Research Ethics Board Approval

This study was approved by the Hamilton Integrated Research Ethics Board prior to starting the study. Participants provided written consent and verbal consent was also obtained at the beginning of recorded interviews. All participants provided electronic informed consent at the start of the online field test survey.

Sampling

To create the BODY-Q Belly Button scale, the general and specific appearance-related codes from the initial BODY-Q concept elicitation dataset were reviewed and a set of items drafted. Instructions and response items were added to measure how (dis)satisfied people have been with their belly button in the past week. To refine this scale, we recruited participants from the original BODY-Q field-test study, which took place between November 2013 and July 2014. In that study, participants were asked if they would be willing to complete additional follow-up surveys.¹³ Of the 354 original participants recruited from the St Joseph's Healthcare bariatric program in Hamilton, 283 participants were willing and had a valid email address. These participants were sent a BODY-Q study newsletter update via email on September 6, 2018, with an invitation to

participate in a cognitive interview to review new BODY-Q scales. Participant were interviewed on a first come, first served basis in September and October 2018.

Cognitive Interviews

Cognitive interviews followed an interview guide with questions to assess comprehension, clarity, and relevance.²⁴ Participants were asked to read each item and to answer using the response options provided. Participants were asked why they gave the answer they did and/or what they were thinking regarding the item. After working through the scale, participants were asked if any items were missing, confusing, or irrelevant. Finally, they were asked if the response options were appropriate. Interviews were audio-recorded, transcribed, and coded. Interviews were conducted in 2 rounds (3 in the first round, and 2 in the second round) to provide the opportunity to make changes between rounds.

Quantitative Phase

Data Collection

As part of a larger study to field-test new BODY-Q scales,^{19,25} the Belly Button scale was included alongside other BODY-Q scales in a web-based survey that was approved by the local IRBs (Brigham and Women's Hospital, Boston, MA protocol number #2019P000168). We recruited a sample from the online research platform Prolific Academic (www.prolific.co) and from Amazon Mechanical Turk (Mturk) (<https://www.mturk.com>), comprising individuals residing in the United States and Canada, in September 2019. Participants were invited to consider participation in the study using an information letter that described a study to collect population norms for new and existing BODY-Q scales. After giving online informed consent, participants completed the questionnaire via a URL link with data entered directly into a REDCap database.²⁶ The crowdsourcing platforms stipulate a minimum hourly remuneration of US\$6.50 for survey completion. We estimated the time to complete the survey as 20 to 30 minutes, and compensated participants with a payment of US\$3.50.

Data Analysis

The psychometric analysis involved the use of Rasch measurement theory (RMT) analysis, which was performed with RUMM2030 software (RUMM Lab) with the unrestricted partial credit model for polytomous data. RMT analysis is used to determine whether a set of items (observed data) conform to the predictions of the Rasch model, with data that fit the Rasch model yielding reliable and valid measurements. Table 1 shows the RMT analysis tests performed as well as additional tests performed to satisfy COSMIN (CONsensus-based Standards for the selection of health Measurement Instruments) guidelines.^{27,28}

RESULTS

Qualitative

The concept elicitation data were used to draft a 14-item scale. Five female participants with an average age of 46 years (range, 37-56 years) took part in a cognitive interview. Four were Caucasian, all 5 had undergone bariatric surgery, and 2 had undergone abdominoplasty. The 14-item scale was tested in Round 1 with 3 participants (Table 2, column 1). These items were deemed easy to understand and were therefore retained. Three new items were added (Table 2, column 3), based on participant feedback. For example, 2

Table 1. Psychometric Analysis

Test	Description
Reliability	Two reliability coefficients, namely the Person Separation Index and Cronbach's α , are provided by the RUMM2030 software. Reliability coefficients <0.70 are deemed unsatisfactory; coefficients between 0.70 and 0.79 are considered modest; coefficients between 0.80 and 0.89 are deemed adequate; and coefficients between 0.90 and 1.00 are considered good. ⁴²
Targeting	The person and item locations can be assessed to determine the extent of matching between the item set and the sample, allowing an evaluation of whether the item set maps out the range of the construct as experienced by the sample. Targeting can assist in determining the proportion of participants who fall outside the scale's measurement range.
Response threshold order	The response categories need to be ordered such that as the latent trait (ability) increases, the probability of endorsing a response category aligned with more of the latent trait also increases in a predictable manner.
Item fit	The items in a scale must work together both clinically and statistically. Item fit examines the extent to which the observed data fit the expectations of the Rasch model. Item fit is indicated by nonsignificant χ^2 after Bonferroni adjustment and fit residuals that are ideally within the range -2.5 and $+2.5$. Item fit is also examined graphically using item characteristic curves that show the probability of a correct response across different levels of the latent trait.
Differential item functioning	DIF determines if the item fit difficulty hierarchy is consistent across subgroups of people being measured. DIF analysis was performed on a random sample of equal-sized subgroups. We examined DIF for gender, age, and BMI category. Items that evidenced DIF were examined with split scoring and new person locations are correlated with original person locations to determine the impact of DIF.
Dependency	Items in a scale should be independent of one another. Items that are not independent can artificially inflate the scale reliability. We examined residual correlations to identify any >0.20. Dependency can be examined using a subtest to determine the impact of residual correlations on scale reliability.
Unidimensionality	The final set of items for the scale was included in a principle-component analysis in SPSS with the hypothesis that all items would load onto a single factors and factor loadings would be >0.70 to support that each item represents part of the scale's latent variable. ⁴³
Construct validity	Belly Button scale scores were transformed to a scale from 0 (most dissatisfied) to 100 (most satisfied) to test 18 specific predetermined hypotheses (Table 2). <i>P</i> -values <0.05 were considered significant. Normality was assessed with kurtosis (absolute > 2) and skewness (absolute > 2), ⁴⁴ and nonparametric statistics were used when distributions were not normally distributed. Correlations were evaluated using Pearson correlation coefficients and interpreted using COSMIN criteria for the following relationships: correlations ≥ 0.5 for between instruments measuring similar constructs, correlations between 0.3 and 0.5 between instruments measuring related but distinct constructs, and correlations <0.3 between instruments measuring unrelated constructs ²⁸ .

DIF, differential item function.

participants talked about smell and cleanliness, ie, "put like rash or discharge or odor or something as a concern as something that bothers you, because it's just as disturbing, if not more, than how it looks, right?" In Round 2, based on feedback from 2 participants, 2 items that were considered unclear were removed and 1 item was revised (Table 2, column 5). The revised scale included 15 items. There were no participant comments or concerns about the instructions and response options, and therefore these were unchanged after cognitive interviewing.

Quantitative

To validate the Belly Button scale, participants from the larger survey who were satisfied with how attractive their belly button looked were excluded. A total of 372 Prolific participants were included in the analysis. Table 3 shows the sample characteristics.

In the Rasch analysis, we shortened the scale from the 15 items tested to a concise set of 6 items that removed redundancy and covered important belly button features. The data fit the Rasch model for the 6-item scale ($\chi^2 = 22.72$, $df = 24$, P -value = .54). The scale evidenced high reliability with Person Separation Index values of 0.86 and 0.81 and Cronbach α values of .90 and .83 with and without extreme responses, respectively. The scale was well targeted to the sample, with 88.4% scoring within the scale's measurement range. Principal-components analysis supported a single factor, with factor loadings that ranged from 0.78 to 0.86.

Table 4 shows the item-level statistics and Figure 1 shows the threshold map. All response options were properly ordered. The

items displayed a clinical hierarchy that ranged from the item rated the highest for satisfaction ("suits your body") to the item rated the lowest for satisfaction ("looks up close"). All 6 items fit the Rasch model, with nonsignificant χ^2 *P*-values after adjustment for Bonferroni correction and item fit statistics within the acceptable range of -2.5 to $+2.5$. No items showed significant residual correlations exceeding 0.20. There was no evidence of differential item functioning (DIF) for age or BMI groups, but 1 item evidenced DIF for gender (Table 4). When this item was split by gender, Pearson correlations between the person locations for the item before and after splitting the item for DIF resulted in no impact on scoring (correlation = 1.000). Table 4 also includes the Flesch-Kincaid grade level for the 6 items, which indicate that the items were easy to understand (range, grades 2-6).

After transforming the scores to 0 to 100, 40 (10.8%) scored on the floor and 3 (0.8%) scored at the ceiling. The mean [standard deviation] Belly Button scale score for the sample was 40 [21]. The results of hypotheses testing for construct validity are shown in Table 5 (see Supplemental Table 1, available online at <https://doi.org/10.1093/asj/sjaf159>, for more details). The mean scores for the Belly Button scale were higher for participants who reported being more satisfied with how their belly button looks overall ($P < .001$) (eg, Figure 2). Although the Belly Button scale scores were higher for participants who were less bothered by excess hanging skin ($P < .05$), having little or no excess skin did not result in an incremental change in scale scores. Belly Button scale scores did not correlate with age, but was lower ($P = .026$ on independent-sample *t*-test) for women (37.8 [20.8]) than for men (42.6 [20.4]). Higher scores on the Belly Button scale correlated with lower BMI (Pearson $R = -0.19$, $P < .001$). Five

Table 2. Decisions to Retain, Revise, Drop, and Add Items to the BODY-Q Belly Button Scale

Round 1	Decision	Round 2	Decision	Field-test	Decision
How well your belly button <i>suits</i> your body?	Retain		Retain		Retain
The overall <i>size</i> of your belly button?	Retain		Retain		Retain
The <i>shape</i> of your belly button?	Retain		Retain		Retain
How your belly button looks when you see it in a <i>mirror</i> ?	Retain		Retain		Retain
How your belly button looks <i>up close</i> ?	Retain				Retain
The <i>position</i> of your belly button on your abdomen?	Retain		Retain		Drop
The <i>location</i> of your belly button on your abdomen?	Retain		Retain		Drop
How <i>centered</i> your belly button is on your abdomen?	Retain		Retain		Drop
The <i>type</i> of belly button you have (eg, innie or outie)?	Retain		Retain		Drop
The <i>color</i> of your belly button?	Retain		Retain		Drop
How <i>attractive</i> your belly button looks?	Retain		Retain		Drop
How <i>normal</i> your belly button looks?	Retain		Drop		Drop
How much your belly button <i>shows</i> through a snug T-shirt?	Retain		Revise	How much your belly button <i>shows</i> if you wear a snug T-shirt?	Drop
How your belly button looks if you wear a <i>swimsuit</i> that shows your abdomen?	Retain		Drop		
	Add	How deep your belly button is?	Retain		Retain
	Add	How easy your belly button is to clean?	Retain		Drop
	Add	How your belly button smells?	Retain		Drop

Table 3. Characteristics of the Sample (N = 372)

	Characteristic	N	%
Gender	Female	212	57.0
	Male	159	42.7
	Other	1	0.3
Age (years)	18-29	100	26.9
	30-39	74	19.9
	40-49	72	19.4
	50-59	87	23.4
	60 and higher	39	10.5
BMI category (kg/m ²)	Normal: 18.5-24.9	107	28.8
	Overweight: 25-29.9	98	26.3
	Class I obesity: 30-34.9	62	16.7
	Class II obesity: 35-39.9	43	11.6
	Class III obesity: 40 and higher	62	16.7

of the 6 correlation hypotheses between the Belly Button scale and other BODY-Q scales were met. The exception was a lower than expected correlation with Belly Button scale scores and the BODY-Q Abdomen scale (Pearson $R = 0.246$, $P < .001$) (Supplemental Table 2, available online at <https://doi.org/10.1093/asj/sjaf159>).

DISCUSSION

The BODY-Q Belly Button scale represents an advance in the assessment of patient satisfaction before and after abdominoplasty and reconstructive procedures involving abdominal tissue. This scale uniquely addresses a gap in existing PROMs by focusing on the aesthetic outcome of the belly button—a small area of notable concern for patients.

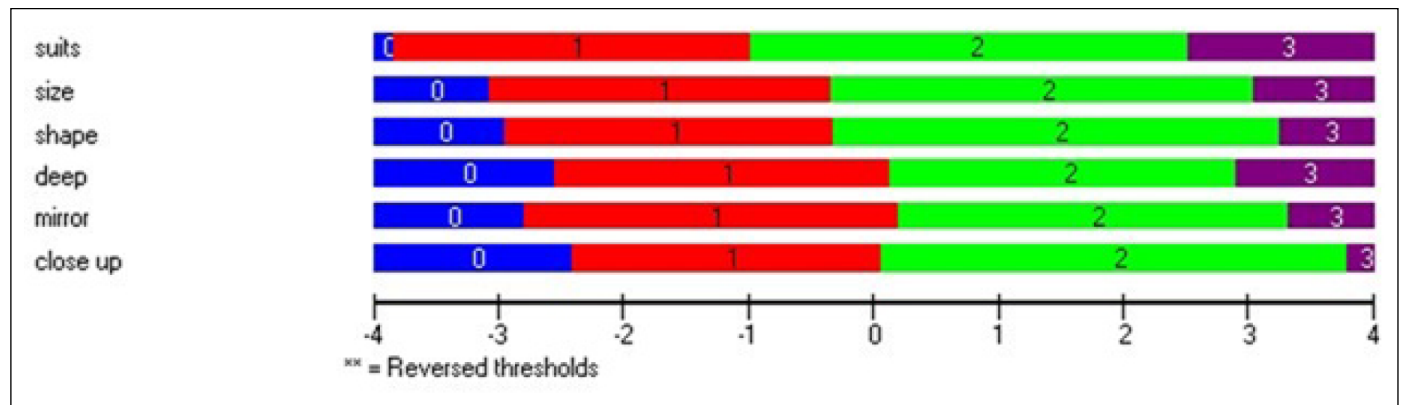
The BODY-Q Belly Button scale was developed from concept elicitation interview data obtained from weight loss and body contouring patients. Overall, our goal was to develop a concise short scale within the BODY-Q framework, ensuring usability while maintaining psychometric robustness. In the cognitive interviews, patients described specific concerns about their belly button, such as smell and cleanliness, which we added to the scale for testing. Although these concerns were relevant to patient experiences, they did not work psychometrically alongside the appearance items and were therefore excluded.

RMT analysis was utilized to reduce the length of the scale and provided evidence supporting its validity and reliability. The

Table 4. RMT Item-Level Fit Statistics and DIF Results

Scale item	Item fit statistics							DIF			FK grade
	Location	SE	Fit residual	df	χ^2	df	P-value	Age	Gender	BMI	
Suits	−0.77	0.10	−1.20	271	6.08	4	.19	—	—	—	3.7
Size	−0.12	0.10	−0.64	271	2.81	4	.59	—	yes	—	5.6
Shape	−0.01	0.10	−2.39	271	5.47	4	.24	—	—	—	2.4
Deep	0.17	0.10	0.92	271	2.13	4	.71	—	—	—	2.4
Mirror	0.24	0.10	−0.92	271	2.26	4	.69	—	—	—	3.8
Close up	0.48	0.10	1.09	271	3.98	4	.41	—	—	—	2.3

DIF, differential item function; FK, Flesch-Kincaid grade level; RMT, Rasch measurement theory; SE, standard error.

**Figure 1.** BODY-Q Belly Button scale threshold map.

psychometric performance supports the use of the Belly Button scale for individuals seeking or undergoing body contouring surgery, either independently or alongside existing BODY-Q scales, in both clinical care and research settings. The rigorous approach to its development underscores the scale's specificity and its ability to capture nuanced aspects of patient satisfaction often missed by generic PROMs.²⁹ This current 6-item scale captures the core domains most predictive of dissatisfaction with the umbilicus.

The belly button is known to significantly impact patient satisfaction with abdominoplasty because it serves as a central focus and an important aesthetic component of the abdominal wall.¹⁰⁻¹² Although numerous PROMs have been developed and validated for body contouring surgery, none provide a dedicated focus on the belly button. For example, the Body-QoL used to assess outcomes in aesthetic and postbariatric body contouring surgery consists of 4 domains, none of which focus on the belly button.^{6,30}

The clinical relevance of this new scale may help to address an area previously overlooked in PRO data.^{9,31,32} In a systematic review, Joseph et al evaluated measures used to define a "good umbilicus," focusing on its position, shape, size, and depth. Despite various techniques—such as stalk plication, periumbilical defatting, and skin sutures—they found no consensus on best practice, highlighting the need for further clinical studies.⁶ Existing PROMs assess general satisfaction and HRQL postabdominoplasty but do not address the umbilicus specifically.³³⁻³⁵ By filling this gap, the BODY-Q Belly Button scale will allow surgeons to better align surgical planning and patient

counseling with individual aesthetic expectations. This level of detail promotes a more comprehensive definition of surgical success—one that includes patient-reported satisfaction. Notably, realistic expectations are critical to achieving higher postoperative satisfaction and improved HRQL.³⁶

This study had several limitations. First, only 5 participants were included in the cognitive interviews, which falls short of COSMIN's recommended number.²⁸ None of the patients included had previously undergone breast reconstruction with abdominal tissue harvest. Recruitment via the crowdsourcing platform Prolific enabled rapid data collection but may limit generalizability to the abdominoplasty or reconstructive surgery population. The predominance of female participants, although reflective of the typical demographic in bariatric and body contouring surgery, may also limit generalizability.³⁷ Full patient characteristics were not collected regarding previous procedures. Another limitation is the absence of test-retest reliability data—an important psychometric property of PRO instruments—and an expert panel was not included exclusively for this scale. A literature review was not conducted specifically for this scale; however, previous reviews did not identify any studies investigating satisfaction with the umbilicus.^{14,15}

Future research should assess the scale's applicability across diverse patient groups, including those undergoing aesthetic vs reconstructive abdominoplasty, to explore potential demographic and cultural differences regarding satisfaction. This research is particularly relevant given that post-massive weight loss body contouring is

Table 5. Hypotheses Tested to Determine Construct Validity for the BODY-Q Belly Button Scale

Hypothesis	BODY-Q Belly Button scale
Group differences	
Scores will incrementally increase as more satisfied with belly button appearance overall	Y ^a
Scores will incrementally increase as more satisfied with belly button location	Y ^a
Scores will incrementally increase as more satisfied with belly button type (eg, inward outward)	Y ^a
Scores will incrementally increase as more satisfied with how visible your belly button is when wearing a close-fitting T-shirt	Y ^a
Scores will incrementally increase as more satisfied with how attractive the belly button is	Y ^a
Scores will incrementally increase as less bothered by excess skin that hangs	Y
Scores will incrementally increase as more satisfied with appearance of abdomen when naked	Y ^a
Scores will incrementally decrease as report having more excess skin on the abdomen	N
Scores will incrementally decrease as report having higher BMI	Y
Females will score higher than males	Y
Scores will not be correlated with age	Y
Convergent validity	
Scores will correlate <0.3 with the BODY-Q Body Image scale, indicating the scales measure dissimilar constructs	Y ^a
Scores will correlate <0.3 with the BODY-Q Psychological scale, indicating the scales measure dissimilar constructs	Y ^a
Scores will correlate <0.3 with the BODY-Q Sexual scale, indicating the scales measure dissimilar constructs	Y
Scores will correlate <0.3 with the BODY-Q Physical scale, indicating the scales measure dissimilar constructs	Y ^a
Scores will correlate <0.3 with the BODY-Q Social scale, indicating the scales measure dissimilar constructs	Y
Scores will have correlate 0.3-0.5 to the BODY-Q Abdomen scale, indicating the scales measure related but measure dissimilar constructs	N ^a
Scores will correlate 0.3-0.5 to the BODY-Q Excess Skin scale, indicating the scales measure related but measure dissimilar constructs	Y ^a
Total accepted	16
Total hypotheses assessed	18
% accepted	88.88%

Y, yes, hypothesis met; N, no, hypothesis rejected. ^a $P < .001$.

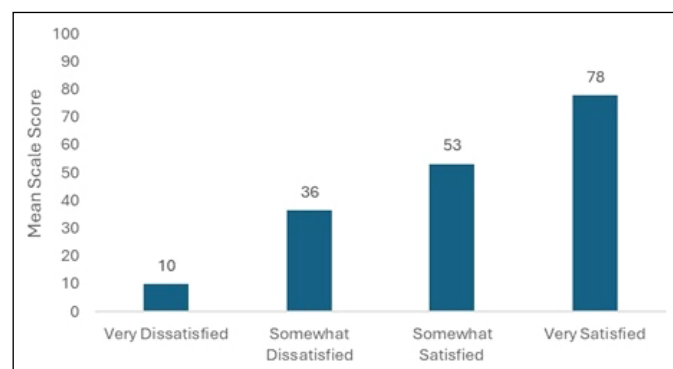


Figure 2. Mean scores for BODY-Q Belly Button scale based on self-reported satisfaction with the overall appearance of the belly button.

considered aesthetic in some countries, while publicly funded as reconstructive surgery in others.³⁸⁻⁴¹ Lastly, longitudinal studies are needed to evaluate sensitivity to change over time, especially in relation to surgical techniques and recovery.

CONCLUSIONS

The BODY-Q Belly Button scale was developed following internationally recommended guidelines for PRO instrument development. This scale addresses the gap in available PRO instruments that have not previously evaluated the belly button in abdominoplasty and in reconstructive procedures involving abdominal tissue. The 6-item scale demonstrated a good fit to the Rasch model, with satisfactory reliability and validity. Its development reflects a step forward in

patient-centered care, providing a foundation for future research and clinical practice aimed at improving patient satisfaction and outcomes in body contouring surgery.

Supplemental Material

This article contains [supplemental material](https://doi.org/10.1093/asj/sjaf159) located online at <https://doi.org/10.1093/asj/sjaf159>.

Disclosures

The BODY-Q Belly Button scale is jointly owned by Memorial Sloan-Kettering Cancer Center (New York, NY) and McMaster University (Hamilton, Ontario, Canada). Drs Klassen and Pusic are co-developers of the BODY-Q and receive a share of license revenues based on inventor-sharing policies. Dr Klassen is an owner of EVENTUM Research, which provides consulting services to the pharmaceutical industry. The other authors declared no potential conflicts of interest with respect to the research, authorship, and publication of this article.

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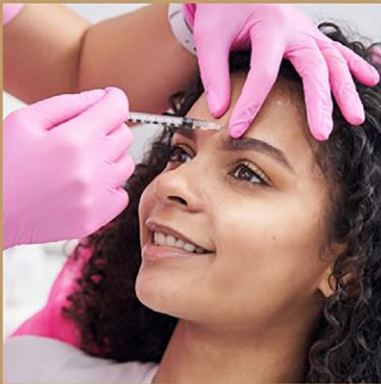
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Therapeutic

Subject-reported Outcomes for Glabellar Line Improvement and Satisfaction With the RelabotulinumtoxinA Ready-to-Use Liquid Formulation: Data From the Phase 3 READY-1 Trial

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Objectives	Methods	Conclusions
Report patient-assessed effectiveness and satisfaction outcomes from relaBoNT-A Phase 3 READY-1 study. 	Adults w/ moderate-to-severe glabellar lines randomized 3:1 to receive relaBoNT-A or placebo. Questionnaires used. 	Adults w/ moderate-to-severe glabellar lines receiving single treatment = significant improvements in 6-month period. 



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Supplemental Table 1. Mean Scale Scores By Patient Characteristics

	N	Mean	SD	95% CI		p-value
				LB	UB	
How your belly button looks overall?						
Very Dissatisfied	62	10	15	6	14	<0.001
Somewhat Dissatisfied	151	36	12	35	38	
Somewhat Satisfied	144	53	12	51	55	
Very Satisfied	12	78	17	67	88	
The location of your belly button on your belly?						
Very Dissatisfied	45	10	15	5	15	<0.001
Somewhat Dissatisfied	71	32	14	28	35	
Somewhat Satisfied	205	46	15	43	48	
Very Satisfied	48	56	23	49	62	
The type of belly button you have (e.g. inward or outward)?						
Very Dissatisfied	45	9	14	5	13	<0.001
Somewhat Dissatisfied	62	34	12	31	37	
Somewhat Satisfied	161	44	15	42	46	
Very Satisfied	101	50	22	46	55	
How visible your belly button is when you wear a close-fitting T-shirt?						
Very Dissatisfied	59	17	22	11	23	<0.001
Somewhat Dissatisfied	130	37	15	35	40	
Somewhat Satisfied	133	48	15	45	51	
Very Satisfied	47	52	22	46	58	
How attractive your belly button looks?						
Very Dissatisfied	98	18	18	15	22	<0.001
Somewhat Dissatisfied	271	48	16	46	50	
How much your excess skin hangs?						
Extremely Bothered	38	30	24	22	37	0.005
Moderately Bothered	35	35	19	28	41	
A Little Bothered	27	46	13	41	51	
Not at all Bothered	10	47	24	29	64	
How your abdomen looks when you are naked?						
Very Dissatisfied	256	37	21	35	40	<0.001
Somewhat Dissatisfied	84	44	17	41	48	
Somewhat/Very Satisfied	29	50	21	42	58	
How much excess skin do you have on your ABDOMEN (i.e.. your belly or tummy area)?						
None/ A little	41	41	18	36	48	0.002
A Moderate Amount	37	41	19	35	48	
A Lot	32	26	23	18	34	
BMI Categories						
Normal/under	106	44	20	40	47	0.025
overweight	96	41	19	37	45	
Obesity	167	37	21	34	40	
GENDER						
Female	209	38	21	35	41	0.029
Male	159	43	20	39	46	

Supplemental Table 2. Pearson Relations Between the Belly Button Scale and Other BODY-Q Scales

	Belly Button
Abdomen	0.246**
Skin	0.295**
Body Image	0.207**
Psychological	0.164**
Sexual	0.127*
Physical	0.150**
Social	0.082

* Correlation is significant at the 0.05 level (two-tailed); ** Correlation is significant at the 0.01 level (two-tailed).