

Development and Validation of a Patient-Reported Outcome Measure for Female Genital Labia Procedures: The LABIA-Q

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Abstract

Background: Demand for interventions to improve the appearance, function, or feel of labia has grown, highlighting the need for a validated patient-reported outcome measure (PROM).

Objectives: The aim of this study was to develop the LABIA-Q for use in ciswomen by following international PROM development guidelines.

Methods: Step 1 involved concept elicitation interviews with women treated at a US outpatient clinic to improve labial appearance, function, or feel, which informed the conceptual framework and preliminary scales. In Step 2, content validity was established and scales refined through cognitive debriefing with patients and clinician input. Step 3 involved field testing with 2 cohorts: an online sample from Prolific and clinical samples from 9 outpatient clinics across the USA and Canada. Item reduction was conducted using the Rasch measurement theory (RMT), along with assessments of test–retest reliability and construct validity.

Results: Twelve qualitative interviews informed the conceptual framework. Cognitive interviews ($n = 7$) and clinician feedback ($n = 11$) yielded 5 scales for field testing. Among 339 participants (mean age 36.2 years, range 18–71 years), RMT analyses supported scale performance. Separate appearance scales were created for Labia, Inner Labia, and Outer Labia, each showing good model fit and high reliability (Person Separation Index [PSI] and $\alpha > 0.9$). The Symptoms, Life Impact, and Sexual scales demonstrated acceptable fit and reliability (PSI and $\alpha \geq 0.8$). Test–retest reliability was high ($n = 140$; intraclass correlation coefficient > 0.8), and construct validity was supported with 80% to 100% of hypotheses confirmed across scales. Validation of the Treatment Outcome scale was limited by sample size.

Conclusions: The LABIA-Q is a valid and reliable PROM for evaluating outcomes of labial interventions across research, clinical practice, quality improvement, and regulatory contexts.

Labial interventions, both surgical and nonsurgical, have expanded rapidly over the past decade. Labiaplasty is the most frequently performed female genital cosmetic surgery in the United States, with

case volumes increasing 5-fold between 2012 and 2022.^{1,2} International data mirror this trajectory; the International Society of Aesthetic Plastic Surgeons reported 189,058 labiaplasty procedures

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worldwide in 2023, a 65.6% increase compared with 2013, when the procedure was first systematically recorded.^{3,4} These numbers likely underestimate true prevalence, because procedures performed outside aesthetic surgery, such as in gynecology, are not included in these numbers. In parallel, nonsurgical modalities such as radiofrequency and laser-based therapies, hyaluronic acid fillers, and platelet-rich plasma are increasingly offered as alternatives or adjuncts, marketed for aesthetic refinement, functional improvement, and regenerative benefits.⁴⁻⁷ This treatment diversification reflects a sustained rise in patient demand and highlights the need for evidence-based, standardized assessment of outcomes.

Women pursue labial interventions for aesthetic, physical, and psychological reasons.⁸⁻¹⁰ Physical drivers include reducing discomfort, alleviating dyspareunia, and improving sexual function.^{8,11-14} Psychological motivators center on genital appearance, confidence, and sexual experience. Studies concordantly report that treatment leads to improvements in body image, sexual satisfaction, and overall health-related quality of life (HRQL), with these benefits sustained over time.¹⁵⁻²¹ Evidence also demonstrates high patient satisfaction and meaningful psychosocial benefit following labiaplasty, alongside low complication rates and minimal adverse effects in most cases.^{13,18,19} The evidence base for nonsurgical interventions remains limited and heterogeneous, constrained by small sample sizes, precluding conclusions about efficacy.²²

Despite the demand for treatment and the reported psychological and sexual benefits, outcome assessment in female labial interventions remains limited. Historically, the field has focused on surgical morbidity, infection rates, and clinician-reported endpoints.^{18,23-25} Although these objective metrics are important, they are insufficient in a field where patient perception defines success. Patient-reported outcome measures (PROMs) are firmly established as essential tools in plastic surgery and the field of aesthetic medicine, offering a standardized means to capture patient-reported experiences. Yet, their use in female genital interventions is fragmented. A systematic review of PROMs used in female genital cosmetic procedures identified 50 instruments across 80 studies, with 26 created ad hoc and 22 adapted from generic measures.²⁶ Only 2 PROMs, the Genital Appearance Satisfaction (GAS) scale and the Cosmetic Procedure Screening Scale—Labiaplasty (COPS-L), have undergone validation in this patient population, however both lack comprehensive coverage of key domains.^{27,28} Thus, although existing literature consistently reports patient-reported improvements, the PROMs used are not sufficiently robust for clinical or research applications.

For surgeons and aesthetic providers offering labial interventions, this gap in available instruments has direct implications for patient counseling, outcome benchmarking, and demonstration of procedural value. A rigorously validated, labia-specific PROM is urgently needed to standardize outcome reporting, guide evidence-based practice, and ensure patient-centered care. The overall goal of this study was to develop a labial intervention-specific PROM for use in ciswomen, called the LABIA-Q, and assess its measurement properties, including test-retest (TRT) reliability and hypothesis-based construct validity.

METHODS

Overview

To develop LABIA-Q, we used a mixed method, 3-step process that is concordant with the internationally established guidelines for PROM

development.^{29,30} First, we conducted concept elicitation interviews to develop a conceptual framework that covers outcomes important to ciswomen seeking labial intervention and to create an item pool and draft LABIA-Q scales. Second, we pilot tested the LABIA-Q scales iteratively using feedback from patients and experts to refine the LABIA-Q scales and demonstrate their content validity. Third, we field-tested the LABIA-Q to identify best-performing items and evaluate the scale's psychometric properties (reliability and validity). Ethics approval for all study stages was obtained from the Hamilton Integrated Research Ethics Board (HiREB #13171 for LABIA-Q FT) and Advarra (US, Pro00027866).

Step 1: LABIA-Q Development

Participants

We recruited participants from a single high-volume, outpatient plastic surgery clinic located in the West Pacific region of the United States. Women were eligible to participate if they were aged 17 years or older, had received a female genital intervention, and were English speaking. A member of the healthcare team reached out to potential participants during their routine clinic visit or through telephone or email and shared study details. With permission, the contact details of interested participants were shared with a member of the research team. The research team member contacted the patient and explained the study objective and procedures in detail, obtained written informed consent, and scheduled the interview.

Concept Elicitation Interview—Purpose and Procedures

An interpretive description approach was used.³¹ An interview guide (Appendix) was used to elicit detailed information on treatment(s), pre- and post-treatment labia appearance, body image, and physical, psychosocial, and sexual well-being and experiences of care. An experienced qualitative interviewer conducted the interviews using a virtual institutionally approved Zoom platform version 5.2.0 or through telephone, depending on participant preference. Verbal consent was affirmed and recorded before the interviews. Each participant self-reported demographic and treatment history information. The interviews were audio-recorded and transcribed verbatim and deidentified before analysis. Interview participants were reimbursed with a \$50 USD card.

Data Analysis

Open axial line-by-line coding was applied to the deidentified transcripts in Microsoft Word for Microsoft 365. A preliminary codebook was developed based on the first interview by 2 study team members (M.N.K. and S.D.C.), which was refined as the analysis progressed. The data were analyzed concurrently with the interviews, with findings used to inform subsequent interviews. All interviews were coded by 1 team member (S.D.C.) and thoroughly checked by a second team member (M.N.K.). Any discrepancies or disagreements were resolved through discussion. The participant quotes and codes from the Word document were extracted using the DocTools Microsoft Word add-on. Extracted data were pasted into Excel for Microsoft 365 for analyses. Constant comparison was used to categorize data into major and minor themes, resulting in the conceptual framework. The item pool was used to draft the LABIA-Q scales to cover concepts corresponding to the conceptual framework. The response options for each scale were informed by the qualitative data. Best practice

principles guided the item development, that is, participant language was retained, medical jargon and double-barreled items were avoided, and items were kept at a Grade 6 reading grade level or below.^{30,32}

Step 2: LABIA-Q Pilot Test

Participants

Participants who took part in the Step 1 concept elicitation interviews and agreed to be recontacted were invited to participate in a cognitive debriefing interview. Additional participants were recruited as needed using the same methodology as in Step 1.

Cognitive Debriefing Interviews—Purpose and Procedures

The participants were emailed the draft LABIA-Q scales before the interview. Participants who preferred to do the interview through phone were asked to have the scales in front of them, whereas those who chose to do the interview through the videoconference platform (Zoom version 5.2.0) viewed them through screen share. An experienced interviewer used an interview guide to conduct “think aloud” interviews to elicit feedback on the ease of understanding of the title, instructions, response options, and the items; nominate missing items; and discuss the relevance of the items and scales to their experience.^{33,34} Participants were provided with a \$50 USD gift card to thank them for their time. Interviews were audio-recorded and transcribed verbatim with identifying information removed. The scales were refined using patient participant feedback.

Feedback From Clinical Experts

The scales were subsequently reviewed by plastic surgeons or cosmetic gynecologists specializing in female genital cosmetic surgery. Experts were sent a Microsoft Word document through email and asked to review the instructions, response options, or items and asked if these were easy to understand for their patients and relevant and if any important concepts were missing.

Data Analysis

The patient participant interviews were analyzed at both the scale component and item-by-item levels. Participant feedback related to scale component and item clarity, relevance, and comprehensiveness was analyzed in Microsoft Word and transferred to Microsoft Excel. Patterns in how participants interpreted and responded to each item, as well as suggestions for improvement or concerns about missing content, were noted. The interviews were coded by 1 study team member (M.N.K.), checked by another team member, and reviewed with the senior author (A.F.K.) to refine the scales (ie, add, drop, or revise scale components). The expert feedback was summarized descriptively and used to further refine the scales, resulting in the field test version of the LABIA-Q.

Step 3—LABIA-Q Field Test

Participants

Two cohorts of participants were recruited. The first cohort was drawn from an online crowdsourcing platform called the Prolific (<https://www.prolific.co>) in November 2022. Eligibility criteria included being 18 years or older, English speaking, residing in the United

States, and self-identifying as female sex and woman as gender. Individuals meeting these criteria were first sent a short screening survey. The survey asked whether they knew what labia were, whether they believed their inner labia were the “right” length, and whether they had any procedures to change the shape or size of the inner or outer labia. Those who did not know what labia were or reported that their labia were the “right” length were excluded. Participants who met the screening criteria were invited to complete the full survey. The second cohort was recruited between December 2022 and February 2024 from 9 outpatient plastic surgery ($n = 5$, 1 in Canada, 4 in the USA) and cosmetic gynecology ($n = 4$, all in the USA) clinics. English-speaking patients who were aged 17 years or older, identified as female sex and woman gender, and had sought or were seeking an intervention to improve the appearance, function, or feel of their labia were included.

Data Collection

Study data were collected and managed using REDCap (Research Electronic Data Capture), a secure, web-based software platform, hosted at McMaster University, Canada.^{35,36} Participants completed demographic (eg, age, education, and marital status) and clinical questions that assessed menopause status, hormone or birth control use, childbirth history (including number and mode of deliveries), and perceptions of their inner and outer labia (length, symmetry, and appearance-related concerns). They also reported labia-related symptoms (eg, discomfort, pain, and chaffing) and functional interference (eg, during physical activity or while wearing tight clothing). Treatment history (ie, do not want, want, had, had and need more) for surgical and nonsurgical procedures to modify the inner labia, outer labia, vagina, clitoral hood, perineum, and mons was recorded using a previously published visual tool.³⁷ For participants who had undergone labial surgery, additional questions were asked about the type of procedure, clinician specialty, sensation, complications, and revisions. All participants completed the LABIA-Q scales and a short set of questions on their acceptability and usability. Eligible participants were recruited through email invitation and provided a link to the REDCap survey.

At the end of the survey, participants were invited to a test-retest (TRT) study. For TRT, they completed the LABIA-Q scales again within 14 days and reported whether they had experienced any important changes in labia-related appearance, symptoms, sexual well-being, or HRQL. The target sample was 100 participants per scale, consistent with COSMIN design criteria.²⁹

Prolific participants for the survey and TRT were compensated at a prorated hourly rate of \$18 USD. Participants recruited through clinics were invited to enter their contact information into a draw for a \$100 gift card.

Analyses

Descriptive statistics were calculated to summarize sociodemographic and clinical characteristics. Psychometric evaluation combined modern item response theory methods and classical test theory approaches. Rasch measurement theory (RMT), a modern form of item response theory, provides a rigorous framework for evaluating whether scale items work together to measure a single underlying construct on an interval-level scale.^{38,39} In essence, Rasch analysis tests whether responses follow a predictable pattern, where higher scores consistently indicate more of the construct being measured. This approach allows researchers to check whether response

Table 1. Sample Characteristics

	Concept elicitation <i>n</i> = 12		Cognitive interviews <i>n</i> = 7		Prolific <i>n</i> = 257		Clinic <i>n</i> = 82		Total field test <i>n</i> = 339	
	<i>n</i>	Valid %	<i>n</i>	Valid %	<i>n</i>	Valid %	<i>n</i>	Valid %	<i>n</i>	Valid %
Country										
US	12	100.0	7	100.0	257	100.0	47	87.0	304	89.7
Canada	0	0.0	0	0.0	0	0.0	7	13.0	7	2.1
Age (years)										
17-29	3	25.0	2	28.6	82	31.9	21	28.4	103	30.4
30-39	5	41.7	2	28.6	96	37.4	21	28.4	117	34.5
≥40	4	33.3	3	42.9	79	30.7	32	43.2	111	32.7
Race										
White/Caucasian	10	83.3	5	71.4	206	80.2	61	75.3	267	78.8
Other	2	16.7	2	28.6	51	19.8	20	24.7	71	20.9
Marital status										
Never married	2	16.7	2	28.6	101	39.3	37	45.1	138	40.7
Separate/divorced/widowed	2	16.7	1	14.3	29	11.3	13	15.9	42	12.4
Married/common law	8	66.7	4	57.1	122	47.5	30	36.6	152	44.8
Other	0	0.0	0	0.0	4	1.6	2	2.4	6	1.8
Prefer not to answer	0	0.0	0	0.0	1	0.4	0	0.0	1	0.3
Education										
Less than college	3	25.0	1	14.3	103	40.1	22	26.8	125	36.9
College completed or more	9	75.0	6	85.7	154	59.9	56	68.3	210	61.9
Prefer not to answer	0	0.0	0	0.0	0	0.0	4	4.9	4	1.2
Procedure type (surgical and nonsurgical)										
Inner labia	8	66.7	7	100.0	1	0.4	70	85.4	71	20.9
Outer labia	3	25.0	1	14.3	0	0.0	20	24.4	20	5.9
Clitoral hood	5	41.7	2	28.6	1	0.4	37	45.1	38	11.2
Vagina (rejuvenation and vaginoplasty)	4	16.7	0	0.0	0	0.0	17	20.7	17	5.0
Perineum	0	0.0	0	0.0	0	0.0	22	26.9	22	6.5
Mons	0	0.0	0	0.0	0	0.0	3	3.7	3	0.9
Had children										
No	4	33.3	2	28.6	129	50.2	37	45.1	166	49.0
Yes	8	66.7	5	71.4	128	49.8	45	54.9	173	51.0
Status inner labia procedure										
I do not want this	2	16.7	0	0.0	141	54.9	6	7.3	147	43.4
I want this	2	16.7	0	0.0	115	44.7	6	7.3	121	35.7

Table 1. Continued

	Concept elicitation <i>n</i> = 12		Cognitive interviews <i>n</i> = 7		Prolific <i>n</i> = 257		Clinic <i>n</i> = 82		Total field test <i>n</i> = 339	
	<i>n</i>	Valid %	<i>n</i>	Valid %	<i>n</i>	Valid %	<i>n</i>	Valid %	<i>n</i>	Valid %
I had this	8	66.7	7	100.0	0	0.0	61	74.4	61	18.0
I had this and need more	0	0.0	1	14.3	1	0.4	9	11.0	10	2.9
Status outer labia procedure										
I do not want this	0	0.0	0	0.0	207	80.5	54	65.9	261	77.0
I want this	0	0.0	0	0.0	50	19.5	8	9.8	58	17.1
I had this	3	25.0	1	14.3	0	0.0	17	20.7	17	5.0
I had this and need more	0	0.0	0	0.0	0	0.0	3	3.7	3	0.9
Current labia-related symptoms										
No	1	8.3	0	0.0	77	34.7	53	82.8	130	38.3
Yes	11	91.7	7	100.0	145	65.3	11	17.2	156	46.0

options function as intended and whether items fit the expected hierarchy.^{40,41} It also assesses targeting (how well item difficulty aligns with patient experiences), reliability, and unidimensionality. Together, these tests ensure that scores are meaningful, comparable, and scientifically robust.⁴⁰⁻⁴³ A summary of the key Rasch tests, their purpose, and interpretation is provided in the [Appendix](#).

After scale content was finalized, scale scores were transformed from Rasch logits to a 0-100 metric, with higher scores representing better outcomes. These scores were used to examine construct validity. Specifically, a series of predefined hypotheses informed by literature and clinical expertise of expected group differences were tested using analysis of variance and independent *t*-test (or the equivalent nonparametric test; [Appendix](#)). For hypotheses examining differences between multiple groups, the resultant group means were examined for incremental increases or decreases between groups. To ensure power, adjacent categories were collapsed to assess statistical differences between groups, given a large difference was not expected between similar categories. Convergent validity was assessed using Pearson correlation coefficients, with coefficient interpreted as follows: <0.3 negligible relationship, 0.3 to 0.5 related but dissimilar construct, ≥0.5 highly related construct, with ≥75% hypothesis confirmation indicating sufficient construct validity.^{29,44} TRT reliability was assessed in participants who completed the TRT survey within 14 days after initial completion and reported no change in the measured construct between assessments, using a 2-way mixed effects model for consistency. Both single and average intraclass correlation coefficients (ICCs) were calculated, with ICC ≥0.70 indicating acceptable reliability.⁴⁴ The standard error of measurement and smallest detectable change (SDC) were also computed at the individual and group levels. Statistical significance was set at *P* < .05.

RESULTS

Step 1: LABIA-Q Development

Twelve interviews were conducted between January 2020 and March 2021. Participant characteristics are described in [Table 1](#). Of

the 12 participants, 3 underwent labiaplasty without clitoral hood reduction, 5 underwent labiaplasty with clitoral hood reduction, 2 underwent a vaginoplasty (of which 1 also had issues with longer inner labia), and 2 underwent vaginal rejuvenation (radiofrequency treatment) exclusively.

The concept elicitation data were organized into top-level domains of HRQL and treatment satisfaction. The HRQL domain included subthemes of Appearance, Psychological Well-being, Physical Well-being, Sexual Well-being, and Life Impact. The treatment satisfaction domain covered satisfaction with the overall outcome of surgery. Illustrative quotes for these subthemes are summarized in [Table 2](#).

In terms of labia appearance, participants described their labia as elongated, thickened, or asymmetrical, often creating visible contours or tissue prominence that did not align with the socially idealized “neat” or “tucked-in” vulvar appearance. Labial visibility was noted both when unclothed and beneath snug clothing, where it sometimes produced a noticeable “camel toe.” To minimize this visibility, many participants reported wearing longer or looser clothing as a concealment strategy, particularly in public (eg, gym) or social settings.

Participants reported various physical symptoms, including soreness, redness or chaffing, swelling, burning, pinching, odor, and challenges related to hygiene or urination and menstruation. These symptoms had a substantial life impact, as they interfered with activities, particularly with exercising and cycling.

Psychologically, many participants described reduced confidence, increased anxiety, and social withdrawal because of stigma and unrealistic ideals of genital normality. Concerns regarding labia appearance led to many participants feeling less feminine, unattractive, and self-conscious, particularly when wearing form-fitting clothing (eg, leggings and swimwear) or engaging in sexual activity. Participants reported feeling embarrassed and “not normal,” which was reinforced by the societal reluctance to speak openly about genital concerns, even with healthcare providers, such as gynecologists or family physicians. Interactions with healthcare providers frequently

Table 2. Key Concepts for Each Domain by Subtheme with Example Quotes to Illustrate Participants' Experiences

Appearance	
1. Size	• "Basically, when I started going through puberty, my labia started to change, and they were very elongated." (P2) • "...mine personally I felt were thicker and longer" (P5) • "I would call it stretched down and enlarged." (P7)
2. Bulge	• "So, it always felt that there was a fullness down there." (P4) • "It was both [discomfort and noticeable]. And not necessarily seeing exactly the labia but seeing a bulge there." (P9) • "...having excess skin down there" (P10)
3. Hang	• "Like before you could see on my labia that the skin was kind of hanging." (P1) • "...I felt it hang out." (P4) • "I still see them, but they [inner labia] don't hang out in any way [after surgery]." (P6)
4. Match/look good together	• "I think the length is almost identical between the two sides." (P4) • "They [labia] were pretty symmetrical [after surgery]" (P6) • "But definitely one side...one side was...bigger at the top and longer at the top and one side was longer at the bottom. They weren't symmetrical." (P9)
5. Normal	• "So not knowing whether or not it was normal, if my labia were normal or abnormal, that sort of thing. That was probably my biggest challenge was figuring out is this what girls deal with all the time?" (P2) • "But I knew that it was kind of outside the normal range." (P4) • "And then when I realized that it's kind of unusual. It's not really quite normal." (P12)
6. Underwear fit	• "...clothing would get stuck in them [underwear]" (P4) • "...uncomfortable in your underwear or tight clothing" (P12) • "I couldn't wear anything...like I wanted to wear something cute and lacey [underwear] or whatever and I just...it was just uncomfortable." (P6)
7. Noticeable in snug clothing or swimsuit	• "When I would wear spandex or tight pants or bathing suits, you would always see the little bulge in my opinion." (P5) • "There was also like in swimsuits, I didn't really feel comfortable wearing certain things because I kind of felt that there was...you could kind of see it in a way." (P6) • "...if it was a tighter pair of jeans or leggings, then I always felt it was noticeable." (P10)
8. Look without clothes	• "...if I wasn't wearing any underwear, you could see it [inner labia]." (P2) • "And when I have no clothes on, it's so obvious." (P12) • "...even just standing up naked, you could see something there." (P9)
Symptoms	
1. Raw from chaffing/rubbing	• "So, if I did have to wear pants for a long time sometimes, my labia would get raw from rubbing against it so much. So, it would be really red and irritated." (P2) • "...they could get chaffed kind of or, you know, for different reasons, kind of friction or tight pants or intercourse or anything like that." (P4) • "And it would also rub and make that same raw kind of feeling." (P5)
2. Burning sensation	• "Like if I just had some dryness going on, they would almost like be an itchy burn..." (P4) • "...like a burning kind of sensation" (P5) • "...a little burning and stinging" (P7)
3. Discomfort - sitting	• "I don't get as much discomfort sitting for long periods of time [after surgery]." (P5) • "Like when I was sitting down in jeans it felt similar, like when you're sitting on a bike and it's super uncomfortable and stiff." (P11) • "It's not comfortable for me to actually have that extra body mass. And it's uncomfortable sitting on a bicycle seat." (P12)
4. Discomfort - walking	• "I felt uncomfortable in my day-to-day walking, trying to exercise..." (P2) • "Even just going for a daily walk would just be...I noticed it and was thinking about it and it was uncomfortable." (P9) • "There was discomfort in those areas [while walking/running], yes, just from being...almost like pinching or that sort of thing." (P10)
5. Irritation	• "I think it was just because of the friction and the constant rubbing, and they [labia] got extremely irritated during intercourse that they would swell up." (P5) • "It would definitely swell and get kind of itchy and irritated." (P6) • "And I would shave and then the skin would be there, and it would be just kind of irritated and rubbing on itself." (P10)
6. Sore/hurt	• "But it definitely...it would be sore there. If you were sitting for a long time, maybe your butt gets sore. I would also be sore in that area [labia], because of the pressure." (P4) • "It just felt almost like sore from sitting for so long in a very tight seat." (P9) • "I think there was a long time where I did not [shave] in the area of the longer labia because they tend to stick out like that and that would have definitely been painful." (P11)
Psychosocial	
1. Self-confidence	• "I think it had a huge impact on my life in general. I think that it really lowered my confidence in myself." (P5) • "I mean yeah, it's really, really boosted my confidence [after surgery]." (P6) • "It has really increased my confidence as a person [after surgery]." (P11)

Table 2. Continued

Psychosocial	
2. Mental health	• "...having something extra to worry about" (P4) • "I would even say a little depression...I mean it brings you down." (P5) • "It just changes everything...it changes how happy you are. I am a ton more happy now [after surgery]." (P10)
3. Attractive	• "It's something that I found genuinely unattractive, unfortunately, looking at myself" (P11) • [Interviewer]: "What about feeling more attractive?" [Participant]: "...I mean, yeah, I guess I do feel more attractive [after surgery]." (P4)
4. Feminine	• "...like I was a half man with a bulge" (P5) • "It didn't make me feel masculine in any way, but it was definitely, I'm a girl and I don't want anything hanging out here. I'm a female. Why is this happening? So I, yes. The answer is yes [affect how feminine you feel]." (P6) • "I definitely felt less feminine before [surgery] than I do now. Even in dresses and skirts, you can feel it [labia], or if it's like...if you can feel something there then it's less feminine." (P9)
5. Type of clothing	• "So, I would have to wear looser pants in order for me to be comfortable at all." (P2) • "So, I would wear long t-shirts to hide my front. And now [after surgery] I can wear them freely and not have to worry about that. So, bathing suits, workout clothes...I am more confident." (P5) • "And it was uncomfortable like tight jeans and all that stuff. But now [after surgery] I can just wear that stuff and I'm not self-conscious and it doesn't feel as tight and uncomfortable." (P9)
6. Enjoy activities	• "And now [after surgery] for me, it's just a bit more freeing knowing that I don't have to think about it and I am able to enjoy in the moment instead of constantly feeling it and adjusting [labia]." (P2) • "Just kind of in general over the summer, either swimming in a pool with close friends or whatever. It just was something that I didn't feel comfortable physically or mentally doing." (P11) • "And then just...it became an inconvenience that it kept me from going to the gym as often because I didn't want to deal with it" (P7)
7. Physical activities	• "...increasingly uncomfortable in terms of working out." (P6) • "Riding was definitely uncomfortable...riding a bike." (P2) • "If I went to the bathroom and then I adjusted them [labia], if I didn't do it quite right, there were times when I would leave the restroom, and it would hurt while I was walking along." (P4)
Sexual	
1. Sexual activity—enjoy	• "So, I feel that I get to enjoy it [sex] more [after surgery] because I'm more in the moment and not having to worry about my appearance." (P5) • "And I didn't have as pleasurable an experience for a long time. In fact, I really didn't enjoy sex that much until after surgery." (P6)
2. Confident sexually	• "And then after [surgery] that just being happier with my sexual experiences now and feeling more confident overall." (P8) • "I definitely feel more confident and more comfortable to explore that [sexual relationships after surgery]." (P11) • "This extra growth there, I would say...probably as far as with my partner and also myself feeling not confident." (P12)
3. Attractive sexually	• "And also sexually, I just feel better about my appearance [after surgery]." (P5) • "I never wanted to wear anything sexy for him or anything like that. I always just felt like that [labia] was a focal point and that was what he was staring at." (P10)
4. Sexual activity—satisfying	• "...it's [sex] a lot easier and not as much pulling, so it's just a better experience for me in that way [after surgery]." (P2) • "I just, honestly, I kind of stayed away from the sex, because for me it was a real disappointment." (P7)
5. Comfortable naked with partner	• "And then sexually, being naked, I was afraid of being naked even around my partner." (P5) • "But for me I didn't want him to look [at labia]." (P6) • "I never wanted to be undressing in front of him [partner] or taking a shower in front of him." (P10) • "Yes. Definitely lights off [during sex]. Yup. I didn't want that [labia] to be seen. Like hiding, trying to hide in the darkness." (P12)
6. Comfortable with body/genitals touched	• "I never really let him do that with me [oral sex], because I was so very self-conscious. So that has definitely changed [after surgery]. I am 1000% comfortable with my body." (P10) • "...that [oral sex] made me really feel uncomfortable, even though I like that type of sex, but knowing that there is the mass there, it made me really embarrassed about it." (P12)
7. How genitals look	• [Interviewer]: "Are you ever self-conscious about the labias during sex?" [Participant]: "It doesn't bother my husband, but it bothers me." (P7) • "But to me in my head, that [labia] was the only thing that was noticed ever [during sexual intimacy]." (P10) • "I'm not going to be intimate with anyone because of the way that I look down there." (P11)
Treatment outcome	
1. Satisfied with outcome	• "I was perfectly satisfied with how it looked." (P4) • "Zero regrets" (P6)
2. Result great	• "...a complete night and day difference" (P6) • "I'm still amazed by my transformation" (P10) • "It's literally the cosmetic look of the entire area has so tremendously improved." (P12)
3. Glad I did it	• "I'm happy with having it done now and it worked out well." (P4) • "I definitely am beyond pleased with my results." (P10) • "I really am super happy, 100% in every which way that I did it." (P12)

Table 2. Continued

Treatment outcome	
4. Got results I wanted	• "I wish she took off a little bit, that she was a little bit less conservative with it. So sometimes I think about that." (P6) • "So, she took a pretty good-sized wedge out and that was...it was perfect." (P10)
5. Better than expected	• "I feel that she [surgeon] did everything and more in exceeding my expectations." (P11) • "I would say it was one of the best things that I've done surgically." (P7)
6. Changed life for better	• "...helped on so many levels" (P5) • "...it was a life saver" (P11) • "It really has changed my life to much better." (P12)
7. Wish done it sooner	• "...that my only regret is that I wish I would have done it sooner." (P9) • "I wish I would have known about this [surgery] years and years ago." (P10) • "I tell myself all the time, why did I wait this long? Why did I not do this so much earlier in my life?" (P12)
8. Recommend to others	• "I certainly would [recommend surgery] to someone who had at least a similar situation to mine. Someone who if they felt the way that I did about their labia." (P4) • "I would absolutely love to be able to encourage anybody at all to get this procedure." (P10)

P, participant.

compounded these negative experiences. Some women reported that their concerns were minimized or dismissed as cosmetic rather than functional, leading to feelings of shame and invalidation. These cumulative effects extended to participant's intimate lives and overall well-being. Few participants mentioned that they avoided sexual encounters because of perceived abnormality or anticipated discomfort. Those who were sexually active often experienced physical pain or discomfort, emotional distress presexual or during sexual activity in anticipation of discomfort, and used frequent positional adjustment during intercourse to minimize pain. The broader impact included reduced sexual satisfaction and diminished self-confidence and avoidance of activities previously associated with pleasure or confidence.

After surgery, however, women consistently reported symptom relief, improved comfort, restored self-image, greater sexual enjoyment, and an enhanced sense of normalcy. Treatment outcomes were often described as life-changing, surpassing expectations, and leaving participants wishing they had pursued labial interventions much sooner.

Guided by the conceptual framework, the item pool was organized into 6 draft LABIA-Q scales with a total of 90 items (Version 1) reflecting the key concepts identified from participant interviews: Appearance, Symptoms, Life Impact, Psychological Well-being, Sexual, and Treatment Outcome.

Step 2: LABIA-Q Pilot Test

The first round of feedback was obtained from cognitive debriefing interviews with 7 participants (4 from Step 1 and 3 new) conducted between February and April 2022 (Table 1). Based on feedback, 79 items were retained, 2 revised, 9 removed, and 2 added, resulting in Version 2. In September 2022, 10 plastic surgeons and 1 cosmetic gynecologist (6 females, 5 males) from the USA, Poland, and the Netherlands reviewed Version 2. Their feedback led to the removal of the Psychological Well-being scale because of overlap with the Life Impact scale, with selected items incorporated into the latter. Additional revisions included rewording 5 Appearance items and adding 9 new items (5 distinguishing inner and outer labia, 2 on color, and 2 on clitoral hood size/appearance). The instructions were

harmonized in the Symptoms and Life Impact scales, 4 items were added to Life Impact, 1 to Sexual, and 4 Treatment Outcome items were reworded. Changes in each round are shown in Table 3. The field test version of the LABIA-Q comprised 5 scales with 88 items.

Step 3—LABIA-Q Field Test

Figure 1 outlines participant recruitment. Data from 339 participants were included in the analyses. Participants were aged 18 to 71 years (mean 36.2, standard deviation 10.7), with the majority residing in the USA (90%). Detailed demographic and clinical characteristics are presented in Table 1.

Scale-level RMT results are shown in Table 4 and item-level results are shown in the Appendix. Of the 88 items tested, 41 items were retained in 6 scales; 3 scales were specific to labia appearance, each covering Symptoms, Sexual, and Life Impact. The Treatment Outcome scale could not be validated in this study because the number of postoperative participants completing this scale was insufficient for Rasch analysis; as such, validation results reported here do not extend to this scale.

Of the 25 appearance items tested, 15 were retained. The Appendix shows the items as they pertain to each appearance scale. Labia Overall includes 7 items that are not specific to inner or outer labia. The Inner Labia and Outer Labia scales each have 11 items. These scales include the 7 core items plus 4 specific items asking about labia looking normal, size, and how much they hang, and how they look in the mirror when unclothed. Separate scales were formed to facilitate clinical translation of the scales and to ensure their applicability in both research and clinical care. The Symptoms scale had no endorsement of the "Never" category for multiple items. To improve scale performance, "Always" and "Often" response options were combined, forming 4 response options. After these adjustments, the Rasch analysis proceeded.

Items and scales evidenced strong psychometric performance. All 41 items had ordered thresholds (see Appendix) and fit the Rasch model (nonsignificant *P*-values after Bonferroni adjustment), and 35 items had fit residuals within ± 2.5 (outside values range: ± 2.51 to ± 3.92). Data fit the Rasch model for 4 scales, with marginal misfit in the Sexual ($P = 0.03$) and Symptoms ($P = 0.02$) scales. All scales

Table 3. Changes Made to LABIA-Q Scales in Each Round of Scale Refinement

Scales	Decisions	Round 1 Participants	Round 2 Experts	Field test	Final
Appearance	Total	<i>n</i> = 20	<i>n</i> = 16	<i>n</i> = 25	<i>n</i> = 15 ^a
	Retain	16	11	15	
	Revise	0	5	0	
	Drop	4	0	10	
	Add	0	9	0	
Symptoms	Total	<i>n</i> = 18	<i>n</i> = 18	<i>n</i> = 17	<i>n</i> = 8
	Retain	15	1	8	
	Revise	2	16	0	
	Drop	1	1	9	
	Add	1	0	0	
Psychological	Total	<i>n</i> = 10	<i>n</i> = 8 ^b	<i>n</i> = 0	NA
	Retain	8	0		
	Revise	0	0		
	Drop	2	8		
	Add	0	0		
Life Impact	Total	<i>n</i> = 12	<i>n</i> = 12	<i>n</i> = 16	<i>n</i> = 10
	Retain	11	0	10	
	Revise	0	12	0	
	Drop	1	0	6	
	Add	1	4	0	
Sexual	Total	<i>n</i> = 16	<i>n</i> = 15	<i>n</i> = 16	<i>n</i> = 8
	Retain	15	15	8	
	Revise	0	0	0	
	Drop	1	0	8	
	Add	0	1	0	
Treatment Outcome	Total	<i>n</i> = 14	<i>n</i> = 14	<i>n</i> = 14 ^c	
	Retain	14	10		
	Revise	0	4		
	Drop	0	0		
	Add	0	0		

^aAppearance scale (15 items) was split into 3 different scales with some overlapping items: labia (*n* = 7 items), inner labia (*n* = 11 items), and outer labia (*n* = 11 items). ^bScale dropped. ^cSample size from field test too small to validate this Treatment Outcome scale.

evidenced high reliability (Person Separation Index [PSI] and α > 0.80, both with and without extremes). Some local dependence was observed in 25 pairs of items with residual correlations >0.30.

When subtests were performed, the number of pairs included in the subtest and the drop in the PSI and Cronbach α -values for each scale were as follows: Labia Overall (3 pairs, drop of 0.07), Inner Labia (7 pairs, 0.09), Outer Labia (10 pairs, 0.12), Life Impact (3 pairs, 0.04), and Sexual (2 pairs, 0.04). After subtests, all PSI and α were still above 0.80 both with and without extremes.

The Person-item threshold distribution for each LABIA-Q scale is shown in the [Appendix](#). Each scale was well targeted with a good range of measurement and few gaps. Additional findings related to targeting are shown in [Table 4](#) (score % and floor and ceiling %). Those that scored outside the range of measurement in the [Appendix](#) tended to score at the high end of the scale. The Appearance and Sexual scales had >90% of participants score on scale with negligible floor and ceiling effects. The Life Impact and Symptoms scales had >20% of participants at the ceiling. However, if postoperative participants are excluded, the ceiling effect dropped to 11.9% and 18.6% for the Life Impact and Symptoms scales, respectively.

All scales evidenced good construct validity with percent of hypotheses accepted for the scales as follows: 86% (12/14) Labia Overall, 80% (8/10) Inner Labia, 80% (8/10) Outer Labia, 100% (6/6) Symptoms, 88% (7/8) Life Impact, and 100% (8/8) Sexual ([Appendix](#)). Group differences were as expected with those who had surgery scoring higher on all scales than those who wanted surgery (P < .001; [Figure 2](#)), and those having labia-related symptoms scoring lower on all scales than those who reported no symptoms (P < .001). For Appearance - Inner Labia, scale scores incrementally decreased with the following: increased visibility of the labia minora (P < .001), reporting being more bothered by inner labial appearance (P < .001), being more self-conscious of inner labial appearance (P < .001), and reporting being less satisfied with inner labial appearance (P < .001). For Appearance - Outer Labia, participants who reported having outer labia that were too big or too small scored lower than those who thought their outer labia were the "right" size (P < .001). Those who had outer labial that were too large, scored lower on the Symptoms, Life Impact, and Sexual scales than those who thought their outer labia were the "right" size (P < .001). Scale scores incrementally decreased with the following: reporting being more bothered by outer labial appearance (P < .001), being more self-conscious of outer labial appearance (P < .001), and reporting being less satisfied with outer labial appearance (P < .001). Finally scores incrementally increased for the Sexual scale as participants reported being more satisfied with their sex life (P < .001).

For convergent validity that examined the association between scales, slightly higher correlations (r = 0.5) than expected were observed for both the Symptoms scale in relation to the 3 Appearance scales, and the Sexual scale in relation to the 3 Appearance scales and the Life Impact scale (P < .001). All other correlations were as expected (P < .001). Detailed results are provided in the [Appendix](#).

A total of 140 participants participated in the TRT reliability study; exclusions are shown in [Figure 1](#) and in the [Appendix](#). All scales demonstrated good TRT reliability with average ICC values >0.85, providing evidence of the stability of the measure. The group SDC values ranged from 0.8 to 1.7 ([Appendix](#)).

DISCUSSION

The LABIA-Q is a novel and comprehensive PROM designed specifically for labial interventions. The LABIA-Q comprises 6 unidimensional

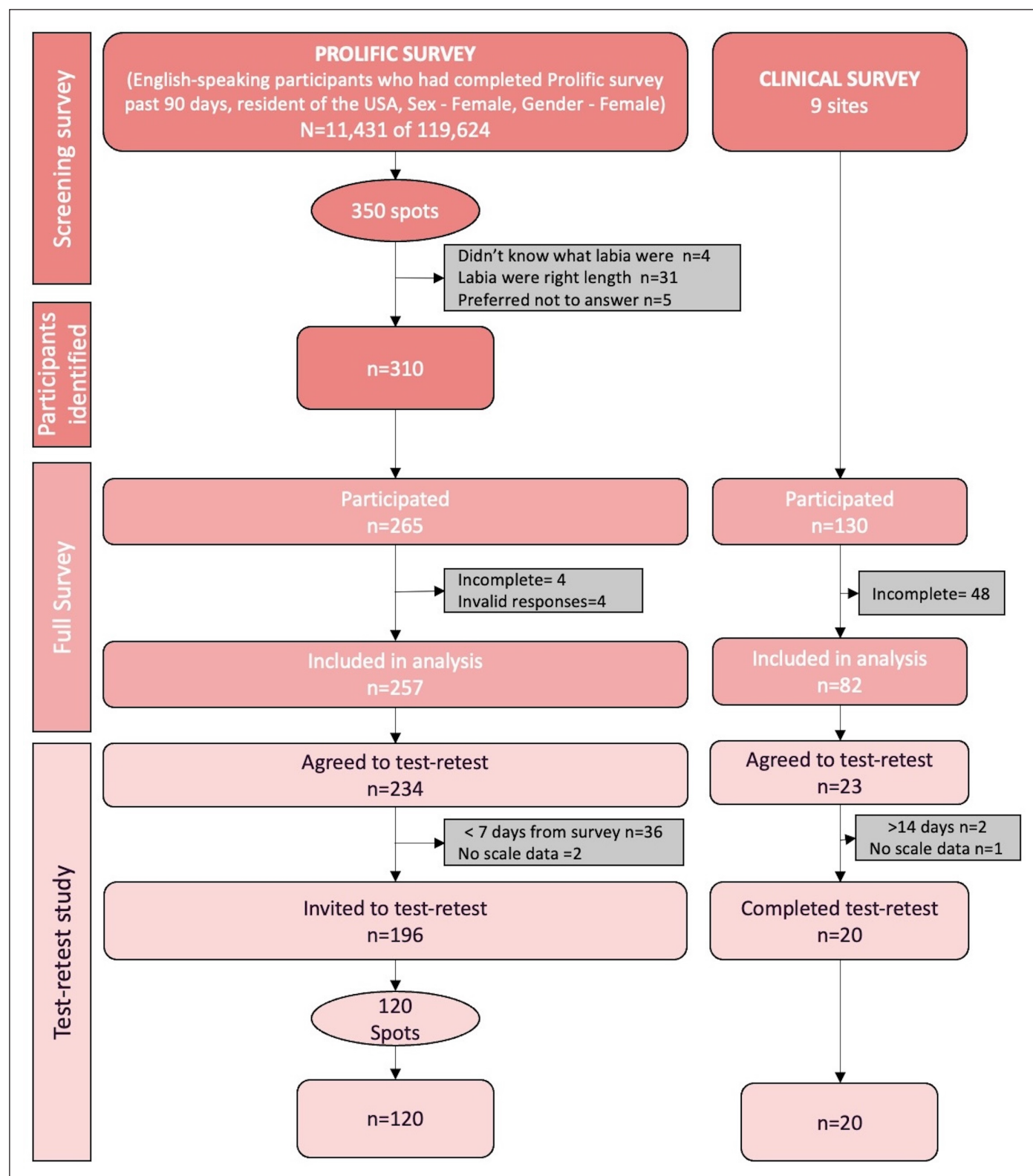


Figure 1. Field test recruitment flowchart.

Table 4. Rasch Measurement Theory Scale-Level Statistics and Other Scale Findings

Scale	No. of items	No. completed	No. in RMT	Score %	χ^2	DF	P-value	PSI + extr	PSI – extr	α + extr	α – extr	± 2.5	P-value	DT	Residual correlations	Floor %	Ceiling %
Labia Overall	7	335	308	91.9	22.32	28	0.77	0.94	0.92	0.95	0.93	1	0	0	3	1.8	6.3
Inner Labia	11	335	312	93.1	48.78	44	0.29	0.96	0.95	0.97	0.96	2	0	0	7	1.8	5.1
Outer Labia	11	335	317	94.6	44.30	44	0.46	0.95	0.94	0.96	0.94	1	0	0	10	0.6	6.0
Life Impact	10	332	260	78.3	45.49	40	0.25	0.90	0.91	0.96	0.93	1	0	0	3	1.2	20.5
Sexual	8	329	312	94.8	49.58	32	0.03	0.90	0.88	0.91	0.89	0	0	0	2	1.2	4.0
Symptoms	8	339	237	69.9	40.53	24	0.02	0.83	0.85	0.94	0.90	1	0	0	0	0.3	29.8

α , Cronbach alpha; +extr, with extremes; –extr, without extremes; DF, degrees of freedom; PCA, principal component analysis; PSI, Person Separation Index; RMT, Rasch measurement theory.

scales assessing labia appearance, life impact, sexual, and symptoms. Each scale is grounded in patient-derived concepts, ensuring content validity through demonstrated clarity, comprehensiveness, and relevance. The scales function independently and are scored separately, allowing clinicians and researchers to select only the domains pertinent to their study or practice, thereby reducing burden for both patients and providers. For appearance, LABIA-Q has 3 options to ensure applicability in both research and clinical care, given that treatments can target the inner, outer, or both labia. Scores are transformed to a 0-100 scale, where higher values indicate greater satisfaction or better outcomes, facilitating straightforward interpretation. In addition, the modular structure of the LABIA-Q allows new scales to be incorporated as emerging concepts are identified, ensuring the instrument remains adaptable and clinically relevant over time.

The LABIA-Q addresses the limitations of existing measures such as the GAS scale and COPS-L.²⁶⁻²⁸ Although both have been validated in cosmetic labia intervention populations, they lack subscales that allow clinicians and researchers to assess distinct domains such as sexual functioning, symptoms, or broader impacts on daily life.²⁶ They also fail to capture the full spectrum of patient experiences before and after surgery, including the impact of unwanted labial symptoms and discomfort preintervention and during recovery. In addition, their focus remains primarily aesthetic, without differentiating between anatomical areas such as the labia minora or labia majora, which limits their relevance for procedures beyond labia minora reduction. Importantly, these scales were not developed following the established guidance for PROM development.²⁶ The LABIA-Q was developed to overcome these shortcomings. It is important to note that the LABIA-Q was developed for cisgender women. For transgender and gender-diverse individuals seeking feminizing genital interventions, the GENDER-Q should be used, because it was designed to capture gender-specific concepts and has demonstrated strong validity and psychometric performance in the adult transgender and gender-diverse populations.^{45,46} Both the LABIA-Q and the GENDER-Q are available for licensing through Q Portfolio.

The LABIA-Q has important applications in clinical research, practice, quality improvement, and regulatory evaluation. In research, its unidimensional scales provide reliable and content-valid endpoints to assess outcomes, compare interventions, and generate evidence that reflects patient priorities. In clinical settings, use of LABIA-Q could

enable systematic assessment of pre- and post-treatment experiences, supporting shared decision making, expectation setting, and monitoring of recovery. At the health system level, aggregated data from LABIA-Q can be used to inform quality improvement by identifying trends in patient-reported outcomes and areas where care delivery may be optimized. There are several established examples of how PROMs have been integrated into clinical registries, routine practice, and regulatory submissions, and applying similar approaches with the LABIA-Q would allow its scales to be used for outcome benchmarking, continuous quality monitoring, and the evaluation of treatment safety and effectiveness in contexts such as aesthetics, where patient-reported outcomes are the primary measure of success.⁴⁷⁻⁴⁹

This study has several limitations. The number of qualitative interviews was relatively small, reflecting the challenges of recruiting participants to discuss a sensitive and personal topic. The field test benefited from including both surgical and nonsurgical participants, enhancing clinical relevance, but the sample was limited by overrepresentation of White (78.8%) and US-based participants, as well as an imbalance between online and clinical cohorts. Although socioeconomic diversity was present, with nearly one-third reporting financial difficulty, the sample may underrepresent individuals who have undergone procedures—who are often of higher socioeconomic status. Importantly, financial constraint does not equate to lack of interest in intervention; rather, it may limit access to such procedures. The demographic homogeneity of the sample may limit the generalizability of the findings to more ethnically, racially, and geographically diverse populations. Future studies should evaluate the LABIA-Q in international settings and in more diverse samples to assess cross-cultural validity and ensure broader applicability. The ceiling effects observed in the Symptoms and Life Impact scales likely reflect the inclusion of post-treatment participants reporting minimal symptoms and little interference with daily life. Although such ceiling effects may limit discrimination among individuals with very good outcomes, they are an expected feature of outcome measures applied following effective interventions and do not detract from the validity of the scales for pre-post comparisons or group-level analyses. Future longitudinal studies are therefore needed to formally evaluate responsiveness and sensitivity to change, including the estimation of minimal important change, in accordance with COSMIN recommendations. Some local dependence was observed among item pairs and addressed using

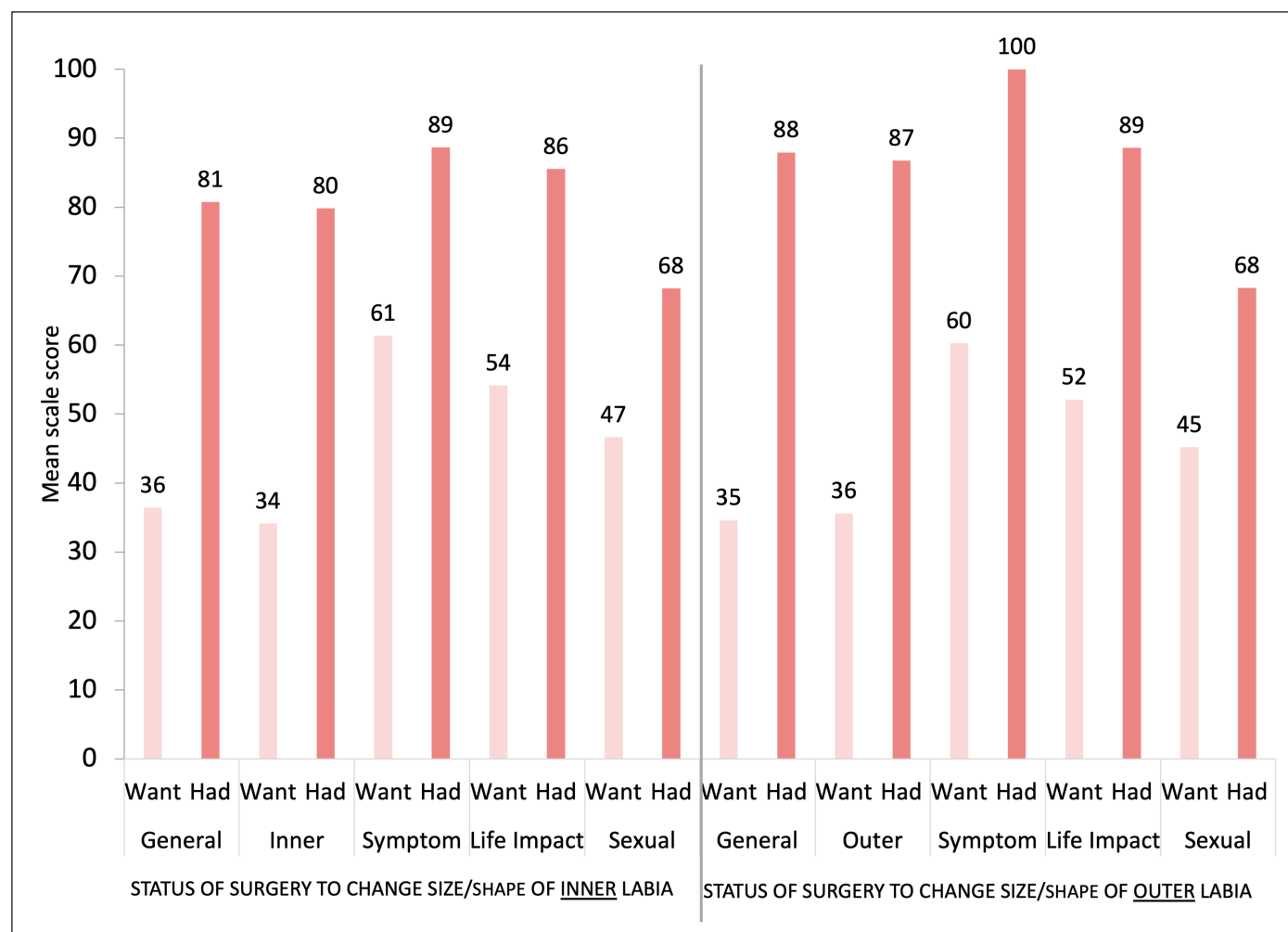


Figure 2. Construct validation example: differences in mean scale scores by surgical status.

subtest analyses, and scale reliability remained acceptable; however, this remains an inherent methodological consideration in RMT-based scale development.³⁹ Finally, the Treatment Outcome scale could not be validated in the current study because of an insufficient sample size. Consequently, future studies with adequately powered postoperative cohorts are required to validate the Treatment Outcome scale.

CONCLUSIONS

The LABIA-Q is a rigorously developed PROM designed to assess outcomes and experiences among cisgender women undergoing labiaplasty and related procedures. This PROM demonstrates strong content validity, construct validity, and reliability, supporting its use in both clinical practice and research.

Supplemental Material

This article contains [supplemental material](https://doi.org/10.1093/asjof/ojag029) located online at <https://doi.org/10.1093/asjof/ojag029>.

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Appendix

Supplemental Material 1: Interview guide to develop the conceptual framework of the LABIA-Q

TREATMENTS	1. What kinds of labial cosmetic treatments have you had/will you have in the future? 2. How long have you wanted to have labial cosmetic treatment? 3. What were your main motivations for having labial cosmetic treatment? 4. How happy/satisfied have you been with the labial cosmetic treatment(s)?
SYMPTOMS	1. Can you describe any symptoms/sensations you experience before/after treatment? <u>Probe</u>: numbness, pain, itch, UTIs, yeast infection, urination, moistness, odor, bleeding, tearing, adhesions, scarring. 2. For each symptom/sensation, how bad is/was it (eg, intensity/severity/frequency)? 3. For each symptom/sensation, how does/did it interfere in your daily life? <u>Probe</u>: which activity limitation is the most important and why? 4. Can you tell me if your labia condition interfere(d) with personal hygiene-related? <u>Probe</u>: use of tampons, cleaning, genital hair.
APPEARANCE	1. Can you describe in detail how your minor/major labia look before and after treatment? <u>Probe</u>: length, show, asymmetry, color, texture, gaps, etc. 2. What do/did you like/dislike about the appearance of your labia?
BODY IMAGE	1. How do you feel about your labial area and how has this changed with treatment? <u>Probe</u>: self-esteem; confidence; self-consciousness; concealment behaviors; clothing issues (eg, bathing suits, thongs, underwear, tight pants)
PSYCHOLOGICAL WELLBEING	1. Before treatment, how did your labia condition affect you emotionally? <u>Probe</u>: negative (self-conscious, distress, irritation, sad) and positive (confident, attractive). 2. Can you describe any changes in your psychological wellbeing after treatment? <u>Probe</u>: positive (feel better, happier, more confident, attractive) and negative (feel worse, self-conscious, unattractive). 3. Out of the psychological concerns you mentioned, can you tell me which are the most/least important and why?
SOCIAL WELLBEING	1. Before treatment, how did your labia condition impact your usual social life and activities? <u>Probe</u>: work, home, social life, dating, activities. <u>Probe</u>: sitting for long hours at work, dressing for work, using washroom frequently to adjust, dating, go out. 2. Can you describe any changes in your social life and activities after treatment? 3. Out of the social concerns you mentioned, can you tell me which are the most/least important and why?
SEXUAL WELLBEING	1. Before treatment, can you describe any symptoms or sensations you experienced in your labial area during sexual activity? <u>Probe</u>: pain, tearing of labia, etc. 2. Can you describe any changes in your sexual life after treatment? <u>Probe</u>: diminished erotic sensation from excess clitoral hood skin, struggle to get penis in, relationship problems due to sex (eg, teasing, comments) 3. Out of the sexual concerns you mentioned, can you tell me which are the most/least important and why?
EXPERIENCE OF CARE	1. What kind of verbal and written information did you receive about your procedure? <u>Probe</u>: gave enough information, let you ask questions, answered your questions, provided information about recovery. 2. What are the people like who care for you? <u>Probe</u>: friendly, made you feel comfortable, easy to talk to, listened to you.
GENERAL	1. Can you describe any other concerns or issues you experienced that we have not already covered?

Supplemental Material 2. Psychometric tests performed to examine reliability and validity

Test	Purpose	Criteria / Interpretation
Thresholds for item response options	Assess whether response categories function as intended (e.g., higher categories reflect more of the construct).	Ordered thresholds indicate response categories function as intended; disordered thresholds suggest collapsing adjacent categories.
Item fit statistics	Evaluate whether item responses conform to Rasch model expectations.	Fit residuals between -2.5 and $+2.5$; chi-square values non-significant after Bonferroni correction; item characteristic curves inspected.
Local dependency	Detect whether items are overly correlated beyond the construct being measured.	Residual correlations ≤ 0.20 above the average residual correlation (≤ 0.30 with stricter criteria). High correlations addressed via subtests or item revision.
Targeting (scale-to-sample)	Determine how well item difficulty matches participant ability levels.	Mean person location close to item mean; broad item spread to cover range of person abilities.
Reliability	Assess internal consistency and precision of measurement.	Person Separation Index (PSI) > 0.70 ; Cronbach's $\alpha > 0.70$; test-retest intraclass correlation coefficient (ICC) > 0.70 .
Construct validity	Evaluate whether the scale measures what it intends to measure.	Convergent/divergent correlations with related scales; known-group differences (e.g., pre- vs. post-treatment).

Supplemental Material 3. LABIA-Q Construct validity hypotheses and results

Topic	Hypothesis	Appearance Scales			Symptoms	Life Impact	Sexual
		Labia Overall	Inner Labia	Outer Labia			
Surgery	1. Those who want surgery to alter the appearance of the inner labia will score lower than those who had surgery to alter the appearance of their inner labia	Y	Y	Y	Y	Y	Y
	2. Those who want surgery to alter the appearance of the outer labia will score lower than those who had surgery to alter the appearance of their outer labia	Y	Y	Y	Y	Y	Y
Symptoms	3. Those who currently report having labia-related symptoms will score lower on all scales than those who report no current symptoms	Y	Y	Y	Y	Y	Y
Appearance – Inner Labia	4. As the length of the inner labia that appears below the outer labia increases scores will incrementally decrease	Y	Y	NA	NA	Y	Y
	5. Scores will incrementally decrease on appearance scales related to the inner labia as participant reports increased amount bothered by appearance of the inner labia	Y	Y	NA	NA	NA	NA
	6. Scales scores will decrease incrementally as participants report being more self-conscious about appearance of inner labia	Y	Y	NA	NA	Y	Y
	7. Scores will incrementally decrease on appearance scales related to the inner labia with decreased satisfaction with appearance of inner labia	Y	Y	NA	NA	NA	NA
Appearance – Outer Labia	8. Those who report having outer labia that are bigger (all scales) or smaller (only tested for appearance-related scales) than they would like will score lower on all scales than those who report outer labia being the right size	Y	NA	Y	Y	Y	Y
	9. Scores will incrementally decrease on appearance scales related to the outer labia as participant reports increased amount bothered by appearance of the outer labia	Y	NA	Y	NA	NA	NA
	10. Scales scores will decrease incrementally as participants report being more self-conscious about appearance of outer labia	Y	NA	Y	NA	Y	Y
	11. Scores will incrementally decrease on appearance scales related to the outer labia with decreased satisfaction with appearance of outer labia	Y	NA	Y	NA	NA	NA
Sexual	12. Sexual scale scores will increase incrementally as participants report being more satisfied with their sex life overall	NA	NA	NA	NA	NA	Y
Convergent Validity	13. The Life Impact scale will be highly related to appearance and symptom scales (>0.5)	Y	Y	Y	Y	NA	NA
	14. The Symptom Scale will be related but dissimilar (0.3-0.5) to the appearance	N	N	N	NA	NA	NA

	15. The Sexual Scale will be related but dissimilar (0.3-0.5) to appearance, life impact and symptom scale	N	N	N	Y	N	NA
Hypothesis Summary	Number Accepted	12	8	8	6	7	8
	Number Tested	14	10	10	6	8	8
	% Accepted	86	80	80	100	88	100

NA, not applicable; Y, Yes-accepted; N, No-not accepted

Supplemental Material 4. LABIA-Q RMT item-level results

Scales	Item Fit Statistics						
Items	Location	SE	Fit Residual	DF	χ^2	DF	p-value
APPEARANCE – LABIA OVERALL							
1. Underwear fit	-0.61	0.08	-1.04	258.05	6.41	4	0.17
2. Style underwear	-0.46	0.07	0.16	256.37	1.46	4	0.83
3. Clothes snug	-0.23	0.07	-0.24	257.21	0.55	4	0.97
4. Swimsuit	-0.12	0.07	-2.05	257.21	2.42	4	0.66
5. Bulge	0.26	0.08	-1.32	257.21	4.98	4	0.29
6. Good overall	0.51	0.08	0.78	258.05	1.13	4	0.89
7. Good together	0.64	0.08	3.17	258.90	5.37	4	0.25
APPEARANCE - INNER LABIA							
1. Underwear fit	-0.85	0.08	0.86	277.69	4.06	4	0.40
2. Style underwear	-0.68	0.07	2.51	275.90	6.34	4	0.17
3. Snug clothes	-0.47	0.07	2.91	276.79	5.12	4	0.28
4. Swimsuit	-0.37	0.07	0.57	276.79	3.98	4	0.41
5. Bulge	0.03	0.08	-0.49	276.79	3.61	4	0.46
6. Stand	0.25	0.08	-1.90	277.69	2.33	4	0.68
7. Good overall	0.29	0.08	-1.20	277.69	4.43	4	0.35
8. Normal	0.36	0.08	-0.81	277.69	3.42	4	0.49
9. Good together	0.41	0.08	0.83	278.59	4.25	4	0.37
10. Size	0.47	0.08	-0.54	277.69	8.14	4	0.09
11. Mirror	0.57	0.08	-2.29	277.69	3.10	4	0.54
APPEARANCE - OUTER LABIA							
1. Normal	-0.54	0.07	1.05	276.79	5.19	4	0.27
2. Stand	-0.43	0.07	-0.25	278.58	1.36	4	0.85
3. Size	-0.40	0.07	0.62	277.68	9.08	4	0.06

4. Underwear fit	-0.31	0.07	-0.77	278.58	5.01	4	0.29
5. Mirror	-0.17	0.07	-0.96	279.48	1.72	4	0.79
6. Style underwear	-0.16	0.07	-0.10	276.79	2.31	4	0.68
7. Snug clothes	0.03	0.07	-0.18	277.68	3.95	4	0.41
8. Swimsuit	0.13	0.07	-1.11	277.68	5.52	4	0.24
9. Bulge	0.47	0.07	-1.22	277.68	1.87	4	0.76
10. Good overall	0.64	0.07	0.01	278.58	2.39	4	0.66
11. Good together	0.74	0.07	3.92	279.48	5.90	4	0.21
LIFE IMPACT							
1. Activities you enjoy	-1.17	0.10	0.35	229.11	2.21	4	0.70
2. Physically active	-0.91	0.09	2.67	229.11	6.72	4	0.15
3. Mental health	-0.61	0.09	-0.95	228.23	4.64	4	0.33
4. Type of clothes	-0.37	0.09	0.76	227.34	0.64	4	0.96
5. Type of underwear	0.10	0.08	1.58	229.11	1.88	4	0.76
6. Feminine you feel	0.14	0.08	-0.36	229.11	4.43	4	0.35
7. Sexual life	0.19	0.09	2.19	230.00	9.92	4	0.04
8. Self-confidence	0.71	0.09	-0.78	230.00	3.16	4	0.53
9. Attractive you feel	0.93	0.08	-1.17	230.00	2.16	4	0.71
10. Good about body	1.01	0.09	-2.03	230.00	9.72	4	0.05
SEXUAL							
1. Enjoy sex	-1.00	0.08	1.54	268.02	4.80	4	0.31
2. Satisfying	-0.70	0.08	-0.10	267.16	1.52	4	0.82
3. Feel good	-0.07	0.08	-1.36	268.02	11.99	4	0.02
4. Genitals touched	-0.06	0.07	-0.72	267.16	2.47	4	0.65
5. Happy with	0.11	0.08	0.10	268.02	6.06	4	0.19
6. Comfortable naked	0.21	0.07	1.84	268.02	3.60	4	0.46
7. Confident	0.55	0.08	-2.01	265.44	9.00	4	0.06

8. Genitals look	0.97	0.07	0.81	267.16	10.15	4	0.04
SYMPTOMS							
1. Cuts	-0.97	0.11	0.80	204.29	5.06	3.00	0.17
2. Burning	-0.87	0.11	0.84	201.71	7.51	3.00	0.06
3. Discomfort sitting	-0.22	0.10	0.99	204.29	0.39	3.00	0.94
4. Discomfort walking	0.01	0.10	1.35	203.43	5.06	3.00	0.17
5. Raw	0.03	0.10	-0.51	201.71	1.90	3.00	0.59
6. Hurts	0.27	0.10	-2.92	204.29	11.02	3.00	0.01
7. Sore	0.64	0.10	-1.62	201.71	6.33	3.00	0.10
8. Irritated	1.10	0.10	-1.50	202.57	3.26	3.00	0.35

SE = Standard Error; DF = degrees of freedom; χ^2 = Chi-square

Supplemental Material 5. Construct validity and reliability results for LABIA-Q

a) Hypothesis based construct validity results for LABIA-Q

Scale	Categories	N	Mean	SD	SE	95% Confidence Interval for Mean		p-value
						LB	UB	
SURGERY								
1. Those who want surgery to alter the appearance of the inner labia will score lower than those who had surgery to alter the appearance of their inner labia								
Appearance – Labia Overall	Want	121	36.4	14.3	1.3	33.8	39.0	<0.001
	Had	59	80.7	16.5	2.1	76.4	85.0	
Appearance – Inner Labia	Want	121	34.1	13.7	1.2	31.6	36.6	<0.001
	Had	59	79.8	15.7	2.0	75.7	83.9	
Symptoms	Want	121	61.4	23.5	2.1	57.1	65.6	<0.001
	Had	61	88.7	22.2	2.8	83.0	94.3	
Life Impact	Want	121	54.1	17.2	1.6	51.0	57.2	<0.001
	Had	57	85.5	21.2	2.8	79.9	91.1	
Sexual	Want	120	46.6	14.1	1.3	44.1	49.2	<0.001
	Had	56	68.2	17.7	2.4	63.5	73.0	
2. Those who want surgery to alter the appearance of the outer labia will score lower than those who had surgery to alter the appearance of their outer labia								
Appearance – Labia Overall	Want	58	34.6	16.2	2.1	30.3	38.9	<0.001
	Had	17	87.9	14.4	3.5	80.5	95.4	
Appearance – Outer Labia	Want	58	35.6	14.6	1.9	31.7	39.4	<0.001
	Had	17	86.8	16.1	3.9	78.5	95.1	
Symptoms	Want	58	60.3	24.3	3.2	53.9	66.7	<0.001
	Had	17	100	0	0	100	100	
Life Impact	Want	58	52.1	18.8	2.5	47.1	57.0	<0.001
	Had	17	88.6	27.3	6.6	74.6	102.6	
Sexual	Want	58	45.2	13.8	1.8	41.6	48.8	<0.001
	Had	17	68.3	21.6	5.2	57.2	79.4	
SYMPTOMS								
3. Those who currently report having labia-related symptoms will score lower on all scales than those who report no current symptoms								
Appearance – Labia Overall	No	127	59.8	21.9	1.9	56.0	63.7	<0.001

	Yes	155	39.8	14.5	1.2	37.5	42.1	
Appearance – Inner Labia	No	127	58.3	21.7	1.9	54.4	62.1	<0.001
	Yes	155	38.1	14.2	1.1	35.8	40.3	
Appearance – Outer Labia	No	127	60.3	19.6	1.7	56.8	63.7	<0.001
	Yes	155	43.7	13.2	1.1	41.6	45.8	
Symptoms	No	130	84.1	19.6	1.7	80.7	87.5	<0.001
	Yes	156	57.8	19.5	1.6	54.7	60.8	
Life Impact	No	125	76.6	20.4	1.8	73.0	80.3	<0.001
	Yes	155	57.7	19.3	1.5	54.7	60.8	
Sexual Wellbeing	No	124	57.1	17.1	1.5	54.1	60.2	<0.001
	Yes	154	48.7	15.5	1.3	46.2	51.2	
INNER APPEARANCE								
4. As the length of the inner labia that appears below the outer labia increases scores will incrementally decrease on all scales (For image see Oomen L, de Wall LL, Rabsztyl PR, Kortmann BB, Oerlemans AJ. Perceptie van en tevredenheid met het uitwendig genitaal: een grootschalig cross-sectioneel vragenlijstonderzoek. seksuologie.:117.)								
Appearance – Labia Overall	None appears from front profile	42	73.7	22.5	3.5	66.6	80.7	<0.001
	Slight amount of inner labia appears below outer labia	73	53.2	16.9	2.0	49.3	57.2	
	A small amount of the inner labia appears below the outer labia	97	47.5	14.7	1.5	44.6	50.5	
	A moderate amount of inner labia appears below outer labia	79	42.2	18.2	2.1	38.1	46.3	
	Substantial amount of inner labia appear below outer labia	38	37.9	23.4	3.8	30.2	45.6	
Appearance – Inner Labia	None appears from front profile	42	73.4	21.8	3.4	66.6	80.2	<0.001
	Slight amount of inner labia appears below outer labia	73	52.5	15.6	1.8	48.9	56.1	
	A small amount of the inner labia appears below the outer labia	97	45.2	13.5	1.4	42.4	47.9	
	A moderate amount of inner labia appears below outer labia	79	40.4	18.0	2.0	36.3	44.4	
	Substantial amount of inner labia appear below outer labia	38	34.7	23.0	3.7	27.1	42.2	
Symptoms	None appears from front profile	43	88.2	20.1	3.1	82.0	94.4	<0.001
	Slight amount of inner labia appears below outer labia	74	77.9	20.6	2.4	73.1	82.6	
	A small amount of the inner labia appears below the outer labia	99	72.8	22.0	2.2	68.4	77.2	
	A moderate amount of inner labia appears below outer labia	80	66.3	23.6	2.6	61.1	71.6	
	Substantial amount of inner labia appear below outer labia	38	62.3	27.7	4.5	53.2	71.4	

Life Impact	None appears from front profile	41	87.5	17.3	2.7	82.0	93.0	<0.001
	Slight amount of inner labia appears below outer labia	72	69.8	18.9	2.2	65.3	74.2	
	A small amount of the inner labia appears below the outer labia	97	67.4	18.3	1.9	63.7	71.1	
	A moderate amount of inner labia appears below outer labia	79	62.2	23.2	2.6	56.9	67.4	
	Substantial amount of inner labia appear below outer labia	38	57.5	25.7	4.2	49.1	65.9	
Sexual	None appears from front profile	41	65.0	20.8	3.2	58.4	71.6	<0.001
	Slight amount of inner labia appears below outer labia	70	54.4	18.6	2.2	50.0	58.8	
	A small amount of the inner labia appears below the outer labia	96	53.8	14.8	1.5	50.8	56.8	
	A moderate amount of inner labia appears below outer labia	78	49.4	14.9	1.7	46.0	52.8	
	Substantial amount of inner labia appear below outer labia	38	43.4	18.4	3.0	37.4	49.5	
4. As the length of the inner labia that appears below the outer labia increases scores will incrementally decrease on all scales - collapsed groups for power								
Appearance – Labia Overall	None	42	73.7	22.5	3.5	66.6	80.7	<0.001
	Slightly/small	170	50.0	15.9	1.2	47.6	52.4	
	Moderate/substantial	117	40.8	20.1	1.9	37.1	44.5	
Appearance – Inner Labia	None	42	73.4	21.8	3.4	66.6	80.2	<0.001
	Slightly/small	170	48.3	14.8	1.1	46.1	50.6	
	Moderate/substantial	117	38.5	19.9	1.8	34.9	42.1	
Symptoms	None	43	88.2	20.1	3.1	82.0	94.4	<0.001
	Slightly/small	173	75.0	21.5	1.6	71.8	78.2	
	Moderate/substantial	118	65.0	24.9	2.3	60.5	69.6	
Life Impact	None	41	87.5	17.3	2.7	82.0	93.0	<0.001
	Slightly/small	169	68.4	18.5	1.4	65.6	71.2	
	Moderate/substantial	117	60.6	24.0	2.2	56.2	65.0	
Sexual	None	41	65.0	20.8	3.2	58.4	71.6	<0.001
	Slightly/small	166	54.1	16.4	1.3	51.6	56.6	
	Moderate/substantial	116	47.4	16.3	1.5	44.4	50.4	
5. Scores will incrementally decrease on appearance scales related to the inner labia as participant reports increased amount bothered by appearance of the inner labia								
Appearance – Labia Overall	Not at all bothered	45	77.7	21.8	3.3	71.1	84.2	<0.001
	A little bothered	120	51.3	12.2	1.1	49.1	53.5	
	Quite bothered	68	43.0	9.9	1.2	40.6	45.4	

	Moderately bothered	56	41.5	16.6	2.2	37.1	46.0	
	Extremely bothered	45	39.2	29.1	4.3	30.5	48.0	
Appearance – Inner Labia	Not at all bothered	45	78.2	20.6	3.1	72.0	84.3	<0.001
	A little bothered	120	50.1	10.4	1.0	48.2	52.0	
	Quite bothered	68	41.2	9.8	1.2	38.8	43.6	
	Moderately bothered	56	38.8	15.1	2.0	34.7	42.8	
	Extremely bothered	45	35.8	28.2	4.2	27.3	44.2	
	5. Scores will incrementally decrease on appearance scales related to the inner labia as participant reports increased amount bothered by appearance of the inner labia - collapsed groups for power							
Appearance – Labia Overall	Not at all bothered	45	77.7	21.8	3.3	71.1	84.2	<0.001
	A little/ Quite bothered	188	48.3	12.0	0.9	46.6	50.0	
	Moderately/Extremely bothered	101	40.5	22.9	2.3	36.0	45.0	
Appearance – Inner Labia	Not at all bothered	45	78.2	20.6	3.1	72.0	84.3	<0.001
	A little/ Quite bothered	188	46.9	11.1	0.8	45.3	48.5	
	Moderately/Extremely bothered	101	37.4	21.8	2.2	33.1	41.7	
6. Scales scores will decrease incrementally as participants report being more self-conscious about appearance of inner labia								
Appearance – Labia Overall	Not at all self-conscious	47	75.5	22.6	3.3	68.8	82.1	<0.001
	A little self-conscious	100	52.7	13.2	1.3	50.1	55.3	
	Quite self-conscious	69	43.8	9.3	1.1	41.6	46.1	
	Moderately self-conscious	53	40.8	16.4	2.3	36.3	45.4	
	Extremely self-conscious	65	40.9	25.2	3.1	34.7	47.2	
Appearance – Inner Labia	Not at all self-conscious	47	75.7	21.7	3.2	69.4	82.1	<0.001
	A little self-conscious	100	51.5	11.5	1.1	49.3	53.8	
	Quite self-conscious	69	42.0	8.8	1.1	39.9	44.2	
	Moderately self-conscious	53	38.7	15.2	2.1	34.5	42.9	
	Extremely self-conscious	65	37.6	24.4	3.0	31.6	43.7	
Life Impact	Not at all self-conscious	45	90.6	15.7	2.3	85.8	95.3	<0.001
	A little self-conscious	100	74.4	17.8	1.8	70.8	77.9	
	Quite self-conscious	69	62.9	13.4	1.6	59.7	66.1	
	Moderately self-conscious	53	60.5	19.0	2.6	55.3	65.7	
	Extremely self-conscious	65	53.6	25.6	3.2	47.2	59.9	

Sexual	Not at all self-conscious	44	71.2	19.4	2.9	65.3	77.1	<0.001
	A little self-conscious	99	53.6	13.6	1.4	50.9	56.3	
	Quite self-conscious	68	51.0	16.1	2.0	47.1	54.9	
	Moderately self-conscious	52	48.2	12.6	1.7	44.7	51.6	
	Extremely self-conscious	65	46.0	19.4	2.4	41.2	50.8	
6. Scales scores will decrease incrementally as participants report being more self-conscious about appearance of inner labia - collapsed groups for power								
Appearance – Labia Overall	Not at all	47	75.5	22.6	3.3	68.8	82.1	<0.001
	A little/ Quite	169	49.1	12.5	1.0	47.2	51.0	
	Moderately/Extremely	118	40.9	21.6	2.0	36.9	44.8	
Appearance – Inner Labia	Not at all	47	75.7	21.7	3.2	69.4	82.1	<0.001
	A little/ Quite	169	47.7	11.4	0.9	45.9	49.4	
	Moderately/Extremely	118	38.1	20.7	1.9	34.3	41.9	
Life Impact	Not at all	45	90.6	15.7	2.3	85.8	95.3	<0.001
	A little/ Quite	169	69.7	17.1	1.3	67.1	72.3	
	Moderately/Extremely	118	56.7	23.1	2.1	52.5	60.9	
Sexual	Not at all	44	71.2	19.4	2.9	65.3	77.1	<0.001
	A little/ Quite	167	52.5	14.7	1.1	50.3	54.8	
	Moderately/Extremely	117	46.9	16.7	1.5	43.9	50.0	
7. Scores will incrementally decrease on appearance scales related to the inner labia with decreased satisfaction with appearance of inner labia								
Appearance – Labia Overall	Extremely Dissatisfied	51	26.5	14.9	2.1	22.3	30.6	<0.001
	Very Dissatisfied	85	40.8	9.9	1.1	38.7	43.0	
	Somewhat Dissatisfied	86	47.7	10.1	1.1	45.5	49.9	
	Somewhat Satisfied	51	55.6	9.2	1.3	53.0	58.2	
	Very Satisfied	27	71.6	15.5	3.0	65.5	77.7	
	Extremely Satisfied	31	89.5	15.2	2.7	83.9	95.1	
Appearance – Inner Labia	Extremely Dissatisfied	51	22.5	12.3	1.7	19.0	26.0	<0.001
	Very Dissatisfied	85	38.2	7.4	0.8	36.6	39.8	
	Somewhat Dissatisfied	86	47.0	7.1	0.8	45.5	48.6	
	Somewhat Satisfied	51	54.8	7.3	1.0	52.7	56.9	
	Very Satisfied	27	70.5	12.9	2.5	65.4	75.6	
	Extremely Satisfied	31	89.9	13.5	2.4	85.0	94.9	

OUTER APPEARANCE								
8. Those who report having outer labia that are bigger or smaller (for appearance scales only) than they would like will score lower on all scales than those who report outer labia being the right size								
Appearance – Labia Overall	They are the right size for me	173	57.0	21.6	1.6	53.8	60.3	<0.001
	They are smaller than I would like	26	43.4	18.7	3.7	35.9	51.0	
	They are bigger longer than I would like	131	42.0	16.9	1.5	39.1	44.9	
Appearance – Outer Labia	They are the right size for me	173	60.4	17.8	1.4	57.8	63.1	<0.001
	They are smaller than I would like	26	45.9	14.6	2.9	40.0	51.8	
	They are bigger longer than I would like	131	42.6	14.8	1.3	40.0	45.1	
Symptoms	They are the right size for me	175	79.7	21.9	1.7	76.4	82.9	<0.001
	They are bigger longer than I would like	134	65.4	23.7	2.0	61.4	69.5	
Life Impact	They are the right size for me	171	73.4	21.0	1.6	70.2	76.6	<0.001
	They are bigger longer than I would like	131	61.4	22.1	1.9	57.6	65.2	
Sexual	They are the right size for me	170	57.3	17.8	1.4	54.6	60.0	<0.001
	They are bigger longer than I would like	131	48.5	16.8	1.5	45.6	51.4	
9. Scores will incrementally decrease on appearance scales related to the outer labia as participant reports increased amount bothered by appearance of the outer labia								
Appearance – Labia Overall	Not at all bothered	151	58.5	22.3	1.8	54.9	62.0	<0.001
	A little bothered	107	47.4	14.2	1.4	44.6	50.1	
	Quite bothered	31	41.4	13.2	2.4	36.6	46.3	
	Moderately bothered	23	33.0	11.2	2.3	28.1	37.8	
	Extremely bothered	22	33.2	26.0	5.5	21.6	44.7	
Appearance – Outer Labia	Not at all bothered	151	61.7	18.3	1.5	58.8	64.7	<0.001
	A little bothered	107	48.9	9.8	0.9	47.0	50.8	
	Quite bothered	31	42.8	12.2	2.2	38.3	47.2	
	Moderately bothered	23	33.9	12.0	2.5	28.7	39.1	
	Extremely bothered	22	33.9	24.5	5.2	23.0	44.8	
9. Scores will incrementally decrease on appearance scales related to the outer labia as participant reports increased amount bothered by appearance of the outer labia - collapsed for power								
Appearance – Labia Overall	Not at all bothered	151	58.5	22.3	1.8	54.9	62.0	<0.001
	A little/ Quite bothered	138	46.0	14.2	1.2	43.6	48.4	
	Moderately/ Extremely bothered	45	33.1	19.7	2.9	27.2	39.0	
Appearance – Outer Labia	Not at all bothered	151	61.7	18.3	1.5	58.8	64.7	<0.001

	A little/ Quite bothered	138	47.5	10.7	0.9	45.7	49.3	
	Moderately/ Extremely bothered	45	33.9	19.0	2.8	28.2	39.6	
10. Scales scores will decrease incrementally as participants report being more self-conscious about appearance of outer labia								
Appearance – Labia Overall	Not at all self-conscious	139	58.9	22.7	1.9	55.1	62.7	<0.001
	A little self-conscious	112	48.2	14.9	1.4	45.4	51.0	
	Quite self-conscious	33	41.8	12.5	2.2	37.4	46.3	
	Moderately self-conscious	27	34.7	12.3	2.4	29.9	39.6	
	Extremely self-conscious	23	33.0	25.1	5.2	22.1	43.9	
Appearance – Outer Labia	Not at all self-conscious	139	62.2	18.4	1.6	59.1	65.2	<0.001
	A little self-conscious	112	49.8	11.3	1.1	47.7	51.9	
	Quite self-conscious	33	43.7	11.3	2.0	39.7	47.7	
	Moderately self-conscious	27	35.9	12.4	2.4	31.0	40.8	
	Extremely self-conscious	23	33.6	23.8	5.0	23.3	43.9	
Life Impact	Not at all self-conscious	137	76.9	21.7	1.9	73.2	80.6	<0.001
	A little self-conscious	112	68.0	17.4	1.6	64.7	71.3	
	Quite self-conscious	33	58.6	15.5	2.7	53.1	64.1	
	Moderately self-conscious	27	49.3	13.4	2.6	44.0	54.6	
	Extremely self-conscious	23	48.9	29.4	6.1	36.2	61.6	
Sexual	Not at all self-conscious	136	59.7	18.9	1.6	56.5	62.9	<0.001
	A little self-conscious	111	51.1	15.6	1.5	48.2	54.0	
	Quite self-conscious	32	44.9	11.1	2.0	40.9	48.9	
	Moderately self-conscious	26	48.3	13.9	2.7	42.7	53.9	
	Extremely self-conscious	23	40.0	17.5	3.6	32.4	47.5	
10. Scales scores will decrease incrementally as participants report being more self-conscious about appearance of outer labia - collapsed for power								
Appearance – Labia Overall	Not at all self-conscious	139	58.9	22.7	1.9	55.1	62.7	<0.001
	A little/ Quite self-conscious	145	46.8	14.6	1.2	44.4	49.2	
	Moderately/ Extremely self-conscious	50	33.9	19.1	2.7	28.5	39.4	
Appearance – Outer Labia	Not at all self-conscious	139	62.2	18.4	1.6	59.1	65.2	<0.001
	A little/ Quite self-conscious	145	48.4	11.6	1.0	46.5	50.3	
	Moderately/ Extremely self-conscious	50	34.8	18.4	2.6	29.6	40.1	
Life Impact	Not at all self-conscious	137	76.9	21.7	1.9	73.2	80.6	<0.001

	A little/ Quite self-conscious	145	65.9	17.4	1.4	63.0	68.7	
	Moderately/ Extremely self-conscious	50	49.1	22.0	3.1	42.9	55.4	
Sexual	Not at all self-conscious	136	59.7	18.9	1.6	56.5	62.9	<0.001
	A little/ Quite self-conscious	143	49.7	14.9	1.2	47.3	52.2	
	Moderately/ Extremely self-conscious	49	44.4	16.1	2.3	39.8	49.0	
11. Scores will incrementally decrease on appearance scales related to the outer labia with decreased satisfaction with appearance of outer labia								
Appearance – Labia Overall	Extremely Dissatisfied	18	16.6	13.5	3.2	9.9	23.3	<0.001
	Very Dissatisfied	42	33.4	10.9	1.7	30.0	36.8	
	Somewhat Dissatisfied	64	43.8	9.5	1.2	41.4	46.1	
	Somewhat Satisfied	95	49.8	11.8	1.2	47.4	52.2	
	Very Satisfied	71	55.9	17.1	2.0	51.9	60.0	
	Extremely Satisfied	43	78.8	24.2	3.7	71.3	86.2	
Appearance – Outer Labia	Extremely Dissatisfied	18	17.8	11.5	2.7	12.1	23.5	<0.001
	Very Dissatisfied	42	35.5	7.6	1.2	33.2	37.9	
	Somewhat Dissatisfied	64	45.1	6.8	0.9	43.4	46.8	
	Somewhat Satisfied	95	51.7	6.0	0.6	50.5	53.0	
	Very Satisfied	71	58.9	11.4	1.4	56.2	61.6	
	Extremely Satisfied	43	82.0	19.1	2.9	76.1	87.8	
SEXUAL FUNCTION								
12. Sexual scale scores will increase incrementally as participants report being more satisfied with their sex life overall								
Sexual	Not at all satisfied	35	34.4	16.3	2.8	28.8	40.0	<0.001
	A Little satisfied	59	42.4	13.4	1.7	38.9	45.9	
	Somewhat satisfied	98	51.6	9.1	0.9	49.8	53.5	
	Very satisfied	99	63.2	12.8	1.3	60.6	65.7	
	Extremely satisfied	28	70.7	21.4	4.0	62.4	79.0	
Sexual - collapsed groups for power	Not at all satisfied	35	34.4	16.3	2.8	28.8	40.0	<0.001
	A little/ Somewhat satisfied	157	48.2	11.7	0.9	46.3	50.0	
	Very/ Extremely satisfied	127	64.8	15.3	1.4	62.1	67.5	

b) Correlations between the scales of LABIA-Q

Scales		Appearance – Labia Overall	Appearance – Inner Labia	Appearance – Outer Labia	Symptom	Life Impact
Life Impact	Pearson Correlation	0.6	0.6	0.6	0.6	
	Sig. (2-tailed)	<0.001	<0.001	<0.001	<0.001	
	N	332	332	332	332	
Symptoms	Pearson Correlation	0.5	0.5	0.5		
	Sig. (2-tailed)	<0.001	<0.001	<0.001		
	N	334	334	334		
Sexual	Pearson Correlation	0.5	0.5	0.5	0.3	0.5
	Sig. (2-tailed)	<0.001	<0.001	<0.001	<0.001	<0.001
	N	328	328	328	328	328

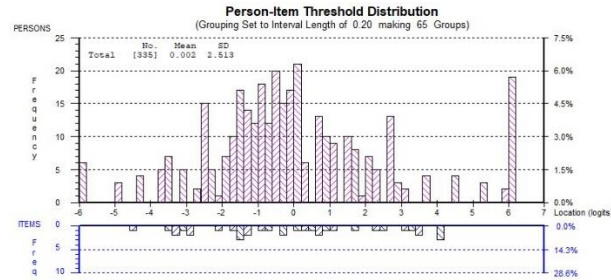
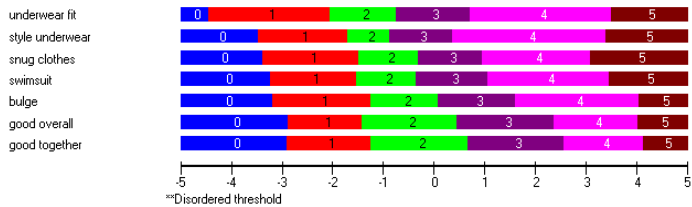
c) Test-retest reliability results for the LABIA-Q

Scales	N	Exclusions		Included	ICC	Means for scales by time point						Smallest detectable change		
		Reported change	Incomplete scale			Time 1		Time 2		Difference		SEM	SDC individual	SDC group
						Mean	SD	Mean	SD	Mean	SD			
Appearance – Labia Overall	140	7	0	133	0.924	48	20	48	19	0	8	3.9	10.9	0.9
Appearance – Inner Labia	140	7	0	133	0.924	49	19	49	19	0	7	3.7	10.3	0.9
Appearance – Outer Labia	140	7	0	133	0.928	50	17	49	18	0	7	3.3	9.2	0.8
Symptoms	140	6	0	134	0.787	67	24	70	20	3	14	7.5	20.8	1.8
Life Impact	140	3	1	136	0.869	68	21	70	21	2	11	5.5	15.3	1.3
Sexual	140	3	1	136	0.705	53	16	53	17	-1	13	6.8	18.9	1.6

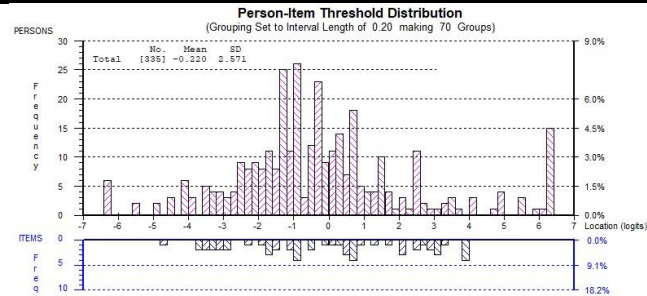
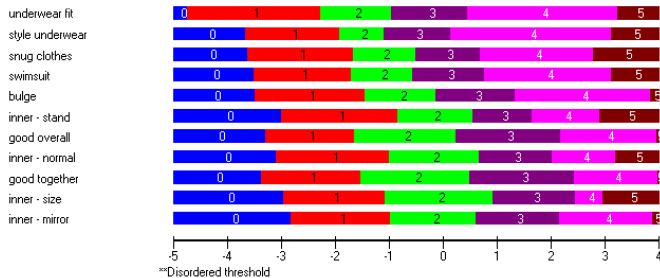
ICC, intraclass correlation coefficient; SD, standard deviation; SEM; standard error of measurement; SDC, smallest detectable change

Supplemental Material 6. Threshold maps and Person-item threshold distributions for LABIA-Q scales (The bottom histogram (blue bars) map out the scale from the poorest (far left) to the best (far right) outcome. The top histogram (pink bars) shows the sample and how they scored in relation to the range of measurement provided by each scale.)

APPEARANCE – LABIA OVERALL (7 items)

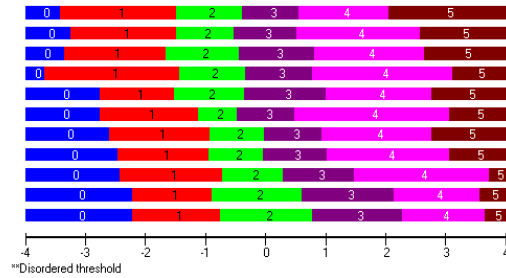


APPEARANCE – INNER LABIA (11 items)



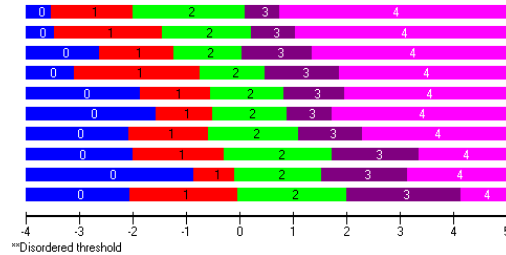
APPEARANCE – OUTER LABIA (11 items)

outer - normal
outer - stand
outer - size
underwear fit
outer - mirror
style underwear
snug clothes
swimsuit
bulge
good overall
good together



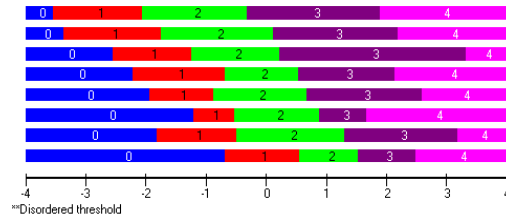
LIFE IMPACT (10 items)

activities enjoy
physically active
mental health
type of clothes
underwear
feminine
sexual life
self-confidence
attractive
good body



SEXUAL (8 items)

enjoy
satisfying
feel good
genitals touched
happy with
comfortable naked
confident sexually
genitals look



SYMPTOMS (8 items)

