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ORIGINAL RESEARCH

Clinical characteristics of adolescents and young adults requesting labiaplasty – A Finnish cross-sectional study

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Abstract

Introduction: Women request labiaplasty due to both physical symptoms and aesthetic concerns. Adolescent labiaplasty may carry higher complication risks than in adults; however, data are scarce. The primary aim of this study was to describe characteristics and comorbidities of adolescents and young adults requesting labiaplasty. The secondary aim was to examine labial dimensions in relation to reported physical and nonphysical symptoms.

Material and Methods: This cross-sectional study was conducted at the Pediatric and Adolescent Gynecology Outpatient Clinic at Helsinki University Hospital, Finland. The study population includes all young women <25 years of age seeking labiaplasty between January 1, 2021, and December 31, 2023. The participants were followed up to August 30, 2024. Data on several subjective physical and psychological symptoms, as well as objective measurements of labia, were collected from patient records. The proportion of young women referred to a plastic surgeon's assessment was recorded.

Results: Altogether 65 young women were included. The median age was 20.2 years (range 11.9–25.4), and 22 (33.8%) of the patients were minors. The median body mass index of the participants was 19.7 kg/m² (range 14.9–34.6 kg/m²), and 18 (27.7%) of the patients were underweight. Twenty-six (40.0%) had at least one psychiatric or neuropsychiatric diagnostic code registered. Fourteen (21.5%) had a current psychotropic medication, and 14 (21.5%) had either a current or previous self-reported eating disorder or disordered eating behavior. Labia minora widths were ≤5 cm in 36 (55.4%) of the patients. There were no significant differences in physical symptoms between those with labia minora ≤5 cm and >5 cm. Of self-reported nonphysical symptoms, anxiety was reported more often among those with labia width >5 cm ($p < 0.005$). In all, 37 (56.9%) were further referred to a plastic surgeon's assessment.

Conclusions: Psychiatric morbidity was common among young women seeking labiaplasty, underlining the importance of exploring mental health issues among these patients. Most women lacked obvious labial hypertrophy. Reported physical symptoms did not correlate with labia size. We suggest that all young women requesting

Abbreviation: PAG, pediatric and adolescent gynecology

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labiaplasty should be met by a specialist team for appropriate patient counseling and evaluation.

KEYWORDS

aesthetics, cosmetic, ethics, female genital mutilation, labial hypertrophy, maturity

1 | INTRODUCTION

Labiaplasty is a surgical procedure that reduces the size of the labia minora and increases symmetry. It is the most common female genital plastic surgery operation,^{1,2} and has continuously attained popularity in recent years.^{3–6} Functional and physical symptoms, like discomfort and twisting in tight clothing, during sports, and daily activities can motivate a patient to seek labiaplasty.^{1,7} Similarly, psychological reasons like heightened self-consciousness, negative self-esteem, and cosmetic appearance concerns can influence the decision to undergo this procedure.^{1,7}

Both common knowledge and research on normal female adolescent external genital development during puberty and early adulthood are limited.⁸ In contrast to male pubertal development, where normal changes in external genitalia are defined by Tanner staging, no such classification, except for pubic hair development, is available for girls.^{9,10} Based on a series of asymptomatic girls, there is great variability and asymmetry in adolescents' labia minora color, length, and width.^{8,11} Labia minora may still grow at least 2 years from menarche. Surgery on external genitalia that are still changing due to hormonal influence may lead to altered outcomes.^{1,11} Additionally, labia minora change after pregnancy, childbirth, and menopause.^{1,12} No universally accepted criteria for labia hypertrophy in adolescent or adult population exist. Concurrently some have suggested a typical variation of labia minora width being 3–50 mm in the adult population.^{13,14} Furthermore, Crouch and colleagues defined marked labial asymmetry as a >30 mm difference in width between the labia.⁴

Labiaplasty as a procedure carries risks. Labia minora are densely innervated and play an essential role in sexual arousal.^{1,14,15} Nevertheless, the long-term physical, functional, and psychosexual effects of labiaplasty are unknown or poorly estimated, particularly when performed in minors.¹⁵ Recent adolescent labiaplasty studies reported higher complication rates than those found in the adult population.^{1,16} Consequently, young women require careful consideration before surgery. Currently, information regarding labiaplasty specific to adolescents is minimal.⁵

The primary aim of this retrospective study was to describe the characteristics and comorbidities of adolescents and young women requesting labiaplasty. The secondary aim was to examine labial dimensions in relation to reported physical and nonphysical symptoms and describe the rate of surgery.

Key message

Adolescents and young adults seeking labiaplasty seldom exhibit physical findings. Concurrently, they have a high rate of mental health symptoms. These patients should be met by specialist teams with an understanding of normal puberty and adolescence to enable appropriate counseling.

2 | MATERIAL AND METHODS

This cross-sectional study was conducted at the Pediatric and Adolescent (PAG) Outpatient Clinic in the Department of Obstetrics and Gynecology of Helsinki University Hospital. All young women under 25 years of age requesting labiaplasty for functional reasons in the special responsibility area of Helsinki University Hospital (Hospital District of Helsinki and Uusimaa, Finland) are first referred to a gynecologist at the PAG Outpatient Clinic. If surgery is indicated or the patient requests a second opinion, the patient is further referred to a plastic surgeon for repeated assessment. In Helsinki University Hospital, all labiaplasty surgery is centralized in the plastic surgery unit. Genital cosmetic surgery for only aesthetic reasons is not performed in public healthcare in Finland. There are no legal age limit restrictions for labiaplasty.

Data were collected from the electronic patient records of outpatient clinical appointments at the PAG clinic between January 1, 2021, and December 31, 2023. The patients requesting labiaplasty were identified with an International Classification of Diseases 10th Revision (ICD-10)-based inquiry in the electronic medical records. All patients with codes N90.6 (Hypertrophy of vulva) or Z03.89 (Encounter for observation for other suspected diseases and conditions ruled out) were assessed. The latter ICD-10 code has been systematically used for patients seeking labiaplasty in the PAG clinic since January 2021. Patients with no concerns about their vulva were excluded from the study.

The PAG appointment includes a thorough psychosocial and somatic history as well as a clinical external genitalia examination. Information was acquired from both routine clinical background information forms used in the clinic and through interviews. Four PAG specialists examined these patients during the study period at the PAG clinic.

Age at the first appointment was collected. For an indicator of physiological maturity, gynecological age was calculated (age at PAG appointment minus age at menarche). The anthropometric measures (weight, height, body mass index [BMI]) were collected from the patient records. If weight or height measurement was missing at the PAG appointment, a value from within 4 months was accepted as a supplement. For girls up to 18 years, age- and sex-adjusted international standardized body mass index (ISO-BMI) values were calculated to allow for comparability with adult BMI categories. BMI or ISO-BMI below 18.5 kg/m² was classified as underweight, and normal BMI or ISO-BMI between 18.5 and 24.9 kg/m².^{17,18}

Measurements of labia minora width and length, as well as descriptions of labial anatomy, were collected from patient records. Labia minora width and length were measured with a ruler with a 0.5 cm accuracy at the PAG appointment. Labia width was measured from the lateral aspect of the vestibule or the hymen to the distal edge of the labia (Figure 1).¹⁹ Labia width >5 cm in one or both labia or labia asymmetry defined as >3 cm difference in width between the labia were considered beyond typical range.^{4,13}

Data collected from the appointment records included additional data on sexual history and previous pregnancies. Psychosocial anamnesis included previous and current psychiatric diagnoses, current psychotropic medication, and previous

self-harm, including suicide attempts. Additionally, information was collected regarding dissatisfaction with other body parts and prior cosmetic procedures and plastic surgeries. Data were collected on the reported physical symptoms and problems, the effect of the labia concerns on sex life, and the potential psychological burden or shame.

Data on plastic surgery appointments were collected from patient records and surgery reports of the Department of Plastic Surgery of Helsinki University Hospital between January 1, 2021 and August 30, 2024. The follow-up for plastic surgery was longer so that data on appointments, surgical decisions, and procedures in the plastic surgery unit could be collected. Data were collected on the proportion of patients referred to a plastic surgeon for a repeated assessment, as well as the number of those further directed to labiaplasty. Possible complications of surgery noted at the post-operative check-up or requiring contact with the plastic surgery unit were recorded. All ICD-10 diagnoses during the total follow-up were collected from the patient management system to detect possible comorbidities.

2.1 | Statistical analyses

Demographic and clinical characteristics with normal distribution are presented as means with standard deviation (SD) or range. Normal distribution was defined with the Shapiro–Wilk test. For variables whose distribution was non-normal, medians with range are reported. Categorical variables are presented as numbers with percentages. Observed numbers less than three are reported as <3 based on the Finnish Act on the Secondary Use of Social and Health Data to protect the identity of small numbers of patients.

Student's *t*-test (for variables with normal distribution) and Mann–Whitney *U* test (for variables with non-normal distribution) were used to compare continuous variables between groups (patients with both labia minora widths ≤5 cm vs. with at least one labia minora width >5 cm and patients referred to plastic surgeon vs. not referred). Discrete variables between groups were compared with Chi-squared and Fisher's exact tests. Statistical analyses were performed with SPSS statistical software, release 29.0.0.0 (SPSS, Chicago, IL, USA).

3 | RESULTS

The study population included 65 young women <25 years of age at the time of referral to the PAG clinic (Figure 2). The characteristics of the patients are given in Table 1. The median age was 20.2 years (range 11.9–25.4), while 22 (33.8%) of the patients were minors. Most of the patients had a gynecological age of over 2 years (Table 1). Most of the patients were either underweight (18 [27.7%]), or of normal weight (25 [38.5%]). Both labia minora measurements were available from 61 (93.8%) of the participants. In 36 (55.4%) of the patients, both labia minora widths were ≤5 cm. At least one labia minora width was >5 cm in 25 (38.5%) of the young women.

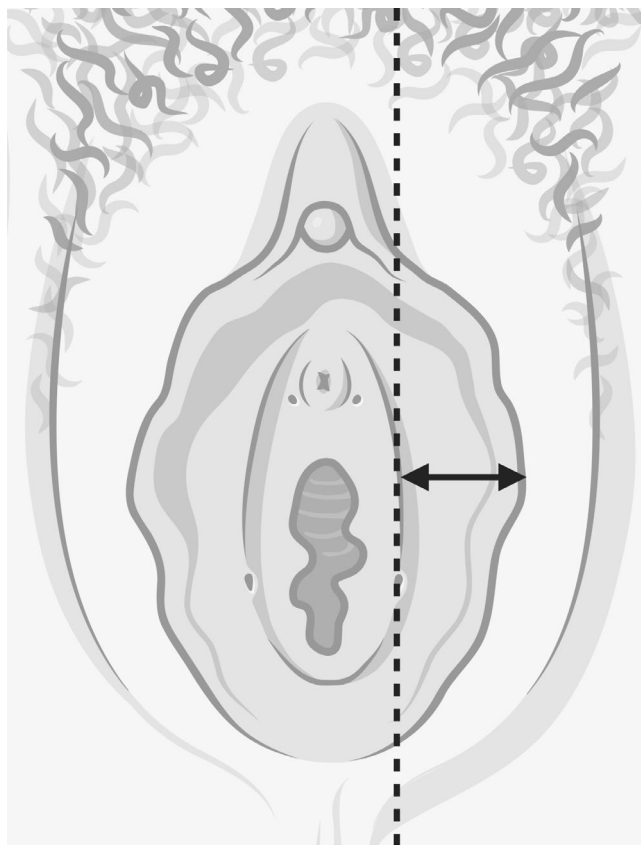


FIGURE 1 Measure (two headed arrow) from the lateral aspect of the vestibule (dotted line) to the most distal aspect of the labia minora.

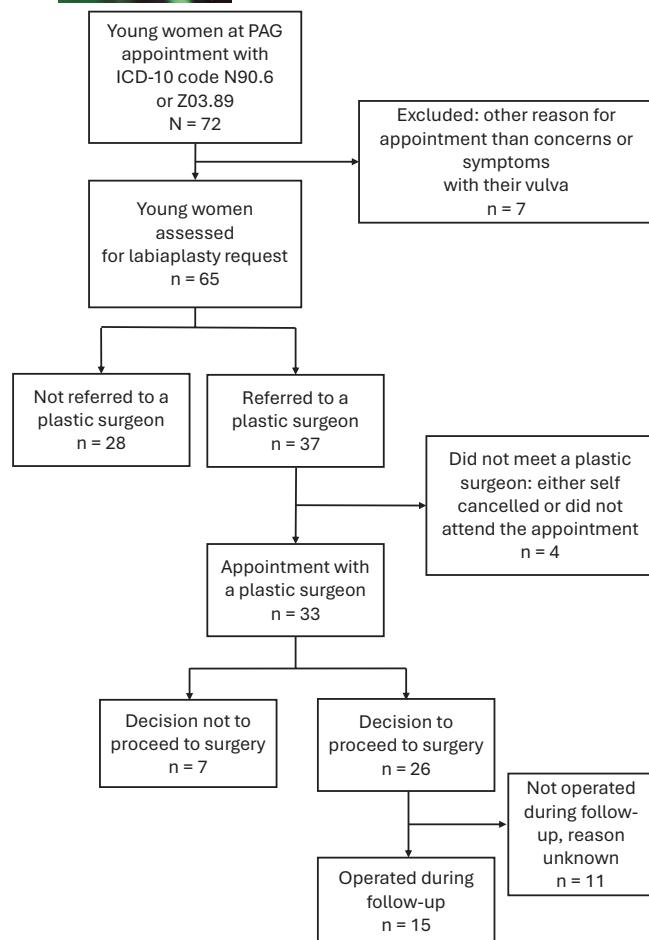


FIGURE 2 Flowchart of clinical assessment of adolescents and young adults requesting labiaplasty between January 1, 2021, and December 31, 2023 at the Helsinki University Hospital Pediatric and Adolescent (PAG) Outpatient Clinic. The participants were followed until August 30, 2024.

Less than three patients had >3 cm difference in width between the labia.

Of the 57 young women whose sexual activity was recorded, 46 (80.7%) had a history of vaginal intercourse. Those with missing data on sexual activity were all under 18 years of age and the youngest in the series.

In terms of mental health, 26 (40.0%) of the patients had at least one psychiatric or neuropsychiatric ICD-code registered during the follow-up (Table 2). Twenty-two (33.8%) of the young women were diagnosed with either depressive or anxiety and stress-related disorders. Ten (15.4%) of our patients had at least one neuropsychiatric diagnosis. Furthermore, 14 (21.5%) patients had either a current or previous self-reported eating disorder or disordered eating behavior. Altogether, 14 (21.5%) of the young women had current psychotropic medication.

Three (4.6%) of our patients reported a traumatic sexual experience. Dissatisfaction toward other parts of their body than external genitalia was reported by 13 (20.0%) (Table 2). Fourteen (21.5%) patients had experienced outsiders commenting on their vulva.

TABLE 1 Characteristics of adolescents and young adults requesting labiaplasty.

Characteristics	n = 65
Age at first PAG appointment (years), median [range]	20.2 [11.9–25.4]
Age at first PAG appointment <18 years, n (%)	22 (33.8)
Gynecologic age at first PAG appointment ^a , n (%)	
<2 years	7 (10.8)
>2 years	48 (73.8)
ISO-BMI/BMI ^b (kg/m ²), median [range]	19.7 [14.9–34.6] ^c
ISO-BMI/BMI categories according to WHO, n (%)	
<18.5	18 (27.7)
18.5–24.9	25 (38.5)
≥25.0	8 (12.3)
Measurements of labia minora (cm)	
Right labia minora width, mean (SD) [range]	4.7 (1.4) [1.0–8.0] ^d
Left labia minora width, mean (SD) [range]	4.6 (1.6) [1.5–9.0] ^e
Labia minora width difference (cm), median, [range]	1.0 [0.0–4.0] ^e
Right labia minora length, median [range]	4.0 [1.0–6.0] ^f
Left labia minora length, median [range]	4.0 [2.0–6.0] ^f
Vaginal intercourse, n (%)	
Prior vaginal intercourse	46 (70.8)
No prior vaginal intercourse	11 (16.9)
Obstetric history, n (%)	
No previous pregnancies	57 (87.7)
Medically induced abortion	5 (7.7)
Delivery	3 (4.6)

Note: For categorical variables the total numbers may not correspond to the entire cohort due to missing data; the percentages are calculated from the entire cohort.

Abbreviations: BMI, body mass index; ISO-BMI, age- and sex-adjusted international standardized body mass index, used for patients <18 years; PAG, pediatric and adolescent gynecology; WHO, World Health Organization.

^aYears after menarche.

^bMeasurement dates of weight and height maximum 4 months from the first outpatient clinic appointment dates were accepted. Measurements recorded more than 4 months from PAG appointment were classified as missing data.

^cData available for 51 patients.

^dData available for 62 patients.

^eData available for 61 patients.

^fData available for 43 patients.

Comments were given by parents (especially mothers), siblings, partners, doctors, or even caregivers in kindergarten.

In all, 62 (95.4%) patients reported some physical symptom or problem, most commonly rubbing or chaffing (57 [87.7%]), and problems with physical activity (40 [61.5%]), including cycling (25

TABLE 2 Psychiatric morbidity and psychosocial problems of adolescents and young adults requesting labiaplasty.

	n = 65
Number of patients having at least one psychiatric and/or neuropsychiatric diagnosis	26 (40.0)
Depressive disorders	16 (24.6)
Anxiety and stress-related disorders	17 (26.2)
Eating disorder diagnoses	3 (4.6)
Attention-deficit hyperactivity disorders (ADHD)	7 (10.8)
Neuropsychiatric diagnoses other than ADHD	5 (7.7)
Personality disorders	4 (6.2)
Gender identity disorders	<3 ^a
Other psychiatric diseases/psychosocial diagnoses	8 (12.3)
Intoxication	7 (10.8)
Psychotropic medication at the time of first PAG appointment	14 (21.5)
Antidepressants	13 (20.0)
ADHD medication	3 (4.6)
Other	3 (4.6)
Self-reported symptoms and behavior	
History of eating disorder behavior	14 (21.5)
Prior eating disorder behavior	9 (13.8)
Current eating disorder behavior (at the time of the first PAG appointment)	5 (7.7)
Prior hospitalization due to eating disorder	0 (0.0)
Self-harm/suicide attempts ever	7 (10.8)
Reported body dissatisfaction	13 (20.0)
Breasts	7 (10.8)
Other parts of body/overall	8 (12.3)
Former cosmetic procedure	6 (9.2)

Note: Data are n (%).

Abbreviation: PAG, pediatric and adolescent gynecology.

^aObserved numbers were listed as <3 based on the Finnish Act on the Secondary Use of Social and Health Data to protect the identity of small numbers of patients.

[38.5%], walking (8 [12.3%]), and riding (7 [10.8%]). The presenting complaints among those with both labia width ≤ 5 cm and those with at least one labia width >5 cm are listed in Table 3. There were no statistically significant differences in any reported physical symptoms or problems between those groups. Those with at least one labia width >5 cm more often reported some nonphysical or mental symptoms compared with those with both labia widths <5 cm. However, of the specific symptoms, only anxiety was more common in a group with labia width >5 cm (Table 3).

Of the 65 patients, 37 (56.9%) were referred to plastic surgeons for repeated assessment either because of the indication for surgery assessed by a PAG specialist or because of the patient's request. The mean width of the larger labia minora was 5.0 cm (SD 1.5) for those who were referred to second opinion ($n=62$) and

TABLE 3 Reported symptoms at time of the first gynecological appointment of adolescents and young adults requesting labiaplasty among those with both labias' width ≤ 5 cm and those with at least one labia width >5 cm.

	Width of both labia ≤ 5 cm, $n=36$	At least one labia width >5 cm, $n=25$	p-Value^a
Reported any physical symptom or problem	35 (97.2)	23 (92.0)	0.56
Pain	9 (25.0)	3 (12.0)	0.33
Rubbing/chaffing	32 (88.9)	21 (84.0)	0.71
Problem using tight clothing	18 (50.0)	15 (60.0)	0.44
Problems with physical exercise or sports	20 (55.6)	17 (68.0)	0.33
Problems with sex or vaginal intercourse	16 (44.4)	14 (56.0)	0.38
Problems with maintaining genital hygiene	3 (8.3)	6 (24.0)	0.14
Problems using tampon or menstrual cup	3 (8.3)	4 (16.0)	0.43
Other functional problems	13 (36.1)	10 (40.0)	0.76
Reported nonphysical or mental symptoms	15 (41.7)	17 (68.0)	0.043
Anxiety	<3 ^b	9	0.005
Shame	6 (16.7)	7 (28.0)	0.29
Low self-esteem	5 (13.9)	3 (12.0)	1.00
Aesthetic concerns (inc. insecurity with labial anatomy)	3 (8.3)	7 (28.0)	0.08
Mentally restricts life (e.g. going to swimming pool, sex positions)	7 (19.4)	10 (40.0)	0.08
Psychiatric diagnosis and social problems	15 (41.7)	9 (36.0)	0.66
Self-reported history of eating behavior	8 (22.2)	5 (20.0)	0.24

Note: Data are n (%) unless otherwise specified.

^aBetween those with both labias' width ≤ 5 cm and those with at least one labia width >5 cm. Comparison with Chi-squared or Fisher's exact tests.

^bObserved numbers were listed as <3 based on the Finnish Act on the Secondary Use of Social and Health Data to protect the identity of small numbers of patients.

4.4 cm (SD 4.20) for those who were not referred ($p=0.002$). A flow chart presents the number of patients proceeding to surgery during the follow-up until August 30, 2024 (Figure 2). The mean age at the time of the surgery was 21.8 years (range 17.1–25.2).

Complications were reported in six (40%) of the 15 patients operated (Table S1).

4 | DISCUSSION

Young women request labiaplasty for various functional, aesthetic, and sexual reasons.^{1,7} Labiaplasty is not performed solely for aesthetic requests in public health care in Finland. According to our data, there is a high incidence of nonphysical factors among young women seeking labiaplasty that should be recognized. Every fifth patient reported disturbed eating behavior, and up to 40% of the patients had at least one psychiatric diagnosis. Moreover, there were no clear associations between objective labia measurements and reported physical symptoms.

Over one quarter of patients were underweight. To the best of our knowledge, a high proportion of underweight women has not been previously reported among those seeking labiaplasty.^{20,21} Although a clear correlation between labia size and patient's weight has not been shown in post-pubertal girls,⁸ scanty fat tissue may contribute to thin outer labia diminishing their protective function and making labia minora more prominent. The thickness and amount of fat tissue of the outer labia and mons pubis protecting the labia minora and vaginal opening correlated with BMI in a series of 214 adult women.²²

The significant number of underweight patients raises a concern about potential underlying eating disorders. In our series, every fifth young woman had a history of disordered eating, which may itself negatively affect body appreciation. In general, the increased prevalence of an underlying psychological disorder among women seeking female genital cosmetic surgery is recognized. In a study of 55 adult women seeking labiaplasty and 70 control women, body dysmorphic disorder was found in 18.2 and 0% respectively.²³ Psychiatric comorbidity is common even among younger patients. In a study by McQuillan et al., including 5–21-year-old patients, seven out of 28 girls (25%) had a diagnosis of depression and one had body dysmorphic syndrome.⁵ Comparatively, in our series, up to 40% of patients had at least one psychiatric or neuropsychiatric ICD diagnosis, and 21.5% were currently on psychotropic medication. Of all the young women in our series, 33 (50.8%) reported psychological and self-esteem concerns regarding their labia.

It is important to note that no official international reference values for labial measurement exist. Overall, external genital variation and diversity between healthy individuals is great.^{4,13,24} A recent review of normative datasets for vulvas, including over 1400 postmenarcheal girls and women, reported wide ranges for labia minor length (5–100mm) and width (1–60mm).²⁵ Labial variation may be even more pronounced among adolescents than those with more advanced gynecological age.³ The most recent work to quantify “normal” labial size in adolescents included 44 individuals ages 10–19 years and found that the labia minora differed in length (asymmetry) in 43% of cases. In the same cohort, the labia

minora widths ranged from 3 to 70mm. Concurrently, more than half the labia minora differed in width, ranging from 1 to 22mm.⁸ In our population of young women with symptomatic labia minora, the variation in width was 10–90mm. All patients in our series were postmenarcheal, and in most cases, the gynecological age was over 2 years. Thus, it is likely that the pubertal development of genitalia was mostly completed.

In addition to a lack of normal reference values, there is a lack of consensus on diagnostic criteria for labia hypertrophy. In the British adult population, labia width over 50mm or labia minor asymmetry over 30mm have been used as criteria for offering surgery.⁴

We examined labial dimensions in relation to reported physical and nonphysical symptoms.

Consistent with a previous study, physical symptoms reported by young women requesting labiaplasty in our study were unrelated to objective findings or labia measurements.⁴ Inconvenience while running or riding a bike is a typical functional symptom in patients seeking labiaplasty.²³ Correspondingly, those were the main physical activities that patients reported as problematic within the current study. Although problems with sexual intercourse were common (47.7% of patients), they did not correlate with labia measurements.

In our study, over 40% of young women did not want to undergo a procedure after the assurance of normal anatomy. Ethical guidance on decision-making and consent developed by the British General Medical Council specifies that clinicians should allow the patient sufficient time to reflect on the information provided before a decision is made.²⁶ This is especially relevant in irreversible labia reduction among young women while there is a paucity of evidence of efficacy for improving sexual and functional results.

Various researchers and gynecologist associations suggest that psychoeducation of young women is utterly important.^{2,5,12,14,19,27} Increasing young women's knowledge on female genital variation increases genital appearance satisfaction and decreases consideration of labiaplasty.²⁸ Education of health care professionals is of utmost importance. Similar to previous British series, most patients in our series were referred either by general practitioners or by private gynecologists.⁴ Adolescents are sensitive, and if any healthcare professional raises a suspicion of abnormality, later reassurance of adolescents' concern is difficult. In future, collecting normative data on outer genitalia measurements in larger populations might help to generate common indications for surgery.

In our small population of 15 young women who proceeded to surgery, six (40%) had a complication diagnosed in the operating unit. Although the small sample size prevents firm conclusions, the rate is a much higher rate than 1%–3% reported earlier in an adult population.^{29–32} Our finding is in line with the limited evidence that exists regarding a higher complications rate after labiaplasty in adolescents. Jodoin and Dubuc reported a complication rate of 20% after labiaplasty in 44 adolescents.¹ In a smaller series, two out of 10 operated minors needed repeated operation.¹⁶ These findings highlight the importance of continuous and systematic follow-up of both complication rates as well as long-term patient satisfaction.

The main strength of this study is our unique centralized public health protocol enabling us to collect a study population including all young women under 25 years of age requesting labiaplasty for physical reasons in the special responsibility area of Helsinki University Hospital during a 3-year study period. Thus, our study is one of the largest on young women requesting labiaplasty. Prior studies concerning patients assessed for or having undergone labiaplasty have included a small number of minors.^{1,5,33-35} An additional strength of our study is the assessment of underlying psychiatric symptoms and diagnoses, not only due to information provided by patients, but also the collection of ICD diagnoses.

This study has certain limitations. Although all the patients during the study period were included, and the population is reasonably large compared with other similar studies, the subgroups are small. It is possible that in a bigger series it would be possible to detect symptoms or complaints that differ according to labia minora size below and above 5 cm. The study is solely based on data collected retrospectively from patient records. We did not use any validated questionnaire or questionnaire especially aimed at those seeking labiaplasty, and thus, lack some data especially on psychosocial factors. The retrospective nature also explains the rather large proportion of missing data for some patient characteristics. The labia minora were measured with 0.5 cm accuracy by four gynecologists who may have had a slightly different technique. Some patient charts lacked data on either labia minora width or length. Thus, the measurements may not be fully exact but rather strongly indicative.

By the end of data collection, some of the referred patients had not yet met a plastic surgeon. Thus, the final operation rate of these young women is not available. Due to retrospective data collection, it is also impossible to systematically assess the rate and severity of complications. To overcome these shortcomings, a prospective study of young women requesting labiaplasty should be performed in the future.

5 | CONCLUSION

Most adolescents and young adults seeking labiaplasty for physical reasons had normal external genital anatomy. Reported physical symptoms did not correlate with labia size. Problems of mental health, including disordered eating, were common. The prevalence of psychological symptoms makes this patient group potentially vulnerable, exposing them to unnecessary interventions. Based on the high prevalence of mental and psychosocial problems in our study population, we suggest that all young women requesting labiaplasty should be able to see a specialist team for evaluation and counseling.

AUTHOR CONTRIBUTIONS

AK conceptualized and designed the study, designed the data collection instruments, collected the data, carried out the initial analyses, participated in interpreting the data, and drafted the initial

manuscript. KR conceptualized and designed the study, designed the data collection instruments, coordinated and supervised data collection and analyses, participated in interpreting the data, and critically reviewed and revised the manuscript. EH conceptualized and designed the study, designed the data collection instruments, coordinated and supervised data collection, participated in interpreting the data, and critically reviewed and revised the manuscript.

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CONFLICT OF INTEREST STATEMENT

The authors have no conflict of interest relevant to this article to disclose.

DATA AVAILABILITY STATEMENT

Restrictions apply to the availability of these data, which were used under license for this study. The data cannot be shared publicly due to data protection and privacy legislation.

ETHICS STATEMENT

The study and data collection were approved by the Research Committee of the Hospital District of Helsinki and Uusimaa (January 17, 2024: HUS/538/2024, with the latest update on September 26, 2024: HUS/537/2024). In Finland, approval from the Ethics Committee is not needed in solely register-based studies when none of the participants are contacted and have no personal involvement.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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