Research Square

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Women's Aesthetic Perceptions of the Genitalia and Their Association with Anatomical Measurements

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Research Article

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Abstract

Background: The purpose of this study to determined women's perceptions of the vulva with the criteria defined in the literature for the ideal vulva and determine their relationship with anatomical measurements in order to determine the extent to which women's perceptions of normal align with our aesthetic standards of normality.

Methods: First of all, a questionnaire was applied to all participants. The items of the data collection form were included personal information, obstetric and gynecological information, their perceptions of their external genitalia and any physical, sexual, psychological, and hygiene problems they experience. Then examination and measurements of the external genitalia were performed.

Results: The majority of participants considered their genitalia normal (n=101, 89.4%), while 12 participants (10.6%) considered them abnormal. Statistical analyses showed that women's perception of their genitalia as normal in appearance and size was associated with labia minora asymmetry (p=0.023 and p=0.006, respectively) and hyperpigmentation (p=0.010 and p=0.047, respectively) but not with labia minora measurements or protrusion (p>0.05)

Conclusions : Although there is a tendency in the field of aesthetic surgery to define ideals and aesthetic standards for all parts of the body, our definitions of normality do not always coincide with those of the individual. The appearance of the genitalia is as personal as the face, and an individual's self-perception is more important than our ideal.

Level IV: Evidence obtained from multiple time series with or without the intervention, such as case studies. Dramatic results in uncontrolled trials might also be regarded as this type of evidence.

Introduction

Women identify their genitalia as normal or abnormal as a result of increasing media attention on the vulva, information shared on the internet, and greater access to photographs and pornography, which are regarded as the ideal (1, 2).

Not only the individual's but also their partner's awareness contributes to this perception. In a large study of women undergoing genital aesthetic surgery, 24% of the women said they had the surgery to improve their male partner's sexual experience and 5% of them stated they had the surgery because their male partner insisted on it (3).

For many women, symmetrical labia minora and clitoris that are completely covered by the labia major are considered normal and aesthetically ideal (4–6). However, dissatisfaction with the external genitalia varies according to age, ethnicity, education level, and geography (7, 8). For example, large labia minora are said to be considered attractive in Rwanda, Japan and Mozambique (9–11).

The concepts of normal or abnormal may also differ between individuals within societies. A vulva that could be considered as within normal limits may be perceived as abnormal by the individual. On the contrary, a hypertrophic vulva may be considered normal even though it causes physical and hygienic discomfort (12). The width of the labium minor, which is defined as normal in the literature, is variable (13–15).

This study aimed to compare women's perceptions of the vulva with the criteria defined in the literature for the ideal vulva and determine their relationship with anatomical measurements in order to determine the extent to which women's perceptions of normal align with our aesthetic standards of normality.

Methods

This study was conducted with women who presented to the obstetrics and gynecology outpatient clinic, were not pregnant, and volunteered to participate in the study. Those who provided verbal and written consent were included. We conducted face-to-face interviews with the participants using a 30-item data collection form. Then the participants' height and weight were recorded, and examination and measurements of the external genitalia were performed. All participants were examined by the same gynecologist (Ç.Y.).

With the participant in standing position, protrusion of the labia minora and clitoris were evaluated based on whether the labia majora completely covered the labia minora and clitoris when viewed from the front.The width and base dimensions of the left and right labia minora were measured in lithotomy position. The labia minor were also evaluated for asymmetry and discoloration. The presence of cystocele and rectocele was evaluated.

Results

Among 132 surveys distributed, 113 women completed the survey and were examined for this study (85.6%). The distribution of ages, education levels, BMI and gynecological backgrounds of the participants are given in the Table 1.

Table 1
Distribution of Demographic Features and Gynecological Backgrounds of the Participants

Age (year)	***Min-Max (Median)***	**19–57 (37)**
	Mean ± Sd	**36.8 ± 10.0**
BMI	*Min-Max (Median))*	17.2–41.0(25.3)
	Mean ± Sd	26.2 ± 4.8
The duration of menstruation(day)	*Min-Max (Median)*	3–15(5)
	Mean ± Sd	5 ± 3
The age at first menstruation	*Min-Max (Median)*	9–16(13)
	Mean ± Sd	12.9 ± 1.5
The sexual life %(n)	Sexually active	77(87)
	Sexually inactive	23(26)
	No previous sexual experience	16,8(19) (37)
The age at first sexual intercourse*	*Min-Max (Median)*	15–37 (23)
	Mean ± Sd	23.2 ± 4.8
Pregnant history %(n)	None	35,3(40)
	At least once	64,6(73)
Menstrual patterns%(n)**	Regular cycle	90.3(93)
	Irregular cycle	9.8(9)
	Menopausal	9.7(11)
Education **%(n)**	Middle school or lower	31 (35)
	High school	10.6 (12)
	Undergraduate	42.5(48)
	Postgraduate (master/doctorate)	15.9(18)

The mean age at first sexual intercourse in the 94 participants. Ninety-two patients reported their menstrual patterns, while the other 11 (9.7%) stated they were menopausal.*

The majority of participants considered their genitalia normal (n = 101, 89.4%), while 12 participants (10.6%) considered them abnormal. In the normal group, only 2 participants reported that their genitalia were larger than normal, whereas all 12 of the participants in the abnormal group stated that they considered their genitalia to be large or very large. Ninety-three participants (82.3%) said the size of their genitalia was unchanged (congenital) and 20 participants (17.7%) reported that their genitalia had changed over time. Of the 14 participants who considered their genitalia large or very large, 6 (42.9%) said it was acquired and 8 (57.1%) said it was congenital.

Eighty-two participants (72.6%) said they were satisfied with the appearance of their genitalia, while 31 (27.4%) were not. Five (35.7%) of the 14 participants who considered their genitalia larger than normal said they were satisfied with their appearance. In contrast, 22 (22.2%) of the participants who considered their genitalia normal were not satisfied with their appearance.

Problems reported by the participants in relation to their external genitalia included physical discomfort (n = 6, 5.3%), difficulty initiating sexual intercourse (n = 2, 1.8%), impact on clothing selection (n = 10, 8.9%), discomfort when wearing tight-fitting clothing (n = 23, 20.4%), negative feedback from their male partner (n = 4, 3.5%), adverse effect on self-confidence (n = 20, 17.6%), adverse effect on quality of life (n = 2, 1.8%), adverse effect on sex life (n = 3, 2.7%), and adverse psychological impact (n = 4, 3.5%). In addition, 15 participants (13.3%) stated that they wanted to undergo genital aesthetic surgery.

On physical examination, labia minora protrusion was detected in 45.1% (n = 51) and asymmetry in 42.5% (n = 48) of the participants. Examination findings are shown in Table 2.

Table 2
Examination findings

	Yes, n (%)	No, n (%)
Labia minora protusion	51 (45.1)	62 (54.9)
Labia majora excess skin	12 (10.6)	101 (89.4)
Labia majora fat atrophy	13 (11.5)	100 (88.5)
Labia majora fascial defect	8 (7.1)	105 (92.9)
Clitoral hypertrophy	3 (2.7)	110 (97.3)
Clitoral protusion	4 (3.5)	109 (96.5)
Hyperpigmentation	38 (33.6)	75 (66.4)
Asymmetry	50 (44.2)	63 (55.8)
	Right labia minora Mean ± SD *(range) median*	Left labia minora *Mean ± SD* *(range) median*
Base length (cm)	3.1 ± 1.2 (0.9-6) 3	3.2 ± 1.2 (0.5-7) 3
Difference in base lengths between labia minora (cm)	0.4 ± 0.4 (0–2) 0.2	
Width (cm)	1.5 ± 0.8 (0.3–4.2) 1.5	1.5 ± 0.9 (0.3-6) 1.5
Difference in widths between labia minora (cm)	0.3 ± 0.4 (0–3) 0.2	

The measurements of volunteers with and without asymmetry and protrusion are shown in Table 3.

Table 3
The participants' distribution according to the Franco classification

	n (%)	Age (years), Mean ± SD (range) median
Type 1: Labia width < 2 cm	70 (61.9)	36.1 ± 9.8 (19–57) 36.5
Type 2: Labia width 2–4 cm	39 (34.5)	37.9 ± 10.8 (23–57) 36
Type 3: Labia width 4–6 cm	3 (2.7)	37 ± 7.6 (28–42) 40
Type 4: Labia width > 6 cm	1 (0.9)	45

The relationship of Self-perception and Examination findings to the desire to have genital aesthetics and the anxiety of receiving negative feedback from the partner were given in

Table 4. Self-perceived abnormality was more frequent in participants under 40 years of age (p = 0.028), whereas those over 40 years of age were more satisfied with the appearance of their genitalia (p = 0.021) (Table 5).

Table 4
The measurements of volunteers with and without asymmetry and protrusion

		n (%)	Base length, Mean ± SD (range) median (cm)	Width, Mean ± SD (range) median (cm)	Difference in base length, Mean ± SD (range) median (cm)	Difference in width, Mean ± SD (range) median (cm)	Hyperpigmentation n (%)	Asymmetry n (%)	Protusion n (%)
Self-perception	Abnormal	12 (10.6)	3.1 ± 0.8 (1.5–4.6) 3	2.0 ± 1.1 (0.5–4.2) 2	0.4 ± 0.4 (0-1.5) 0.5	0.4 ± 0.6 (0–2) 0.2	8 (66.7)	9 (75)	8 (66.7)
	Normal	101 (89.4)	3.4 ± 1.2 (0.9-7) 3.5	1.7 ± 0.9 (0.4-6) 1.5	0.4 ± 0.4 (0–2) 2	0.3 ± 0.4 (0–3) 0.2	30 (29.7)	41 (40.6)	43 (42.6)
	p		0.384[a]	0.184[a]	0.867[a]	0.932[a]	0.015[c]	0.023[b]	0.101[c]
	Normal	99 (87.6)	3.4 ± 1.2 (0.9-7) 3.5	1.6 ± 0.9 (0.4-6) 1.5	0.4 ± 0.4 (0–2) 0.2	0.3 ± 0.4 (0–3) 0.2	30 (30.3)	39 (39.4)	42 (42.4)
	Large	14 (12.4)	3.1 ± 0.8 (1.5–4.6) 3	2.1 ± 1.2 (0.5–4.2) 2	0.4 ± 0.5 (0-1.5) 0.5	0.4 ± 0.6 (0–2) 0.1	8 (57.1)	11 (78.6)	9 (64.3)
	p		0.318[a]	0.111[a]	0.816[a]	0.721[a]	0.047[b]	0.006[b]	0.106[c]
	Satisfied	82 (72.6)	3.4 ± 1.2 (0.9-7) 3.5	1.6 ± 0.9 (0.4-6) 1.5	0.4 ± 0.4 (0–2) 0.2	0.3 ± 0.5 (0–3) 0.2	24 (29.3)	33 (40.2)	36 (43.9)
	Unsatisfied	31 (27.4)	3.3 ± 1.1 (1.5-6) 3.5	1.8 ± 1.0 (0.5–42) 1.5	0.4 ± 0.4 (0-1.5) 0.4	0.3 ± 0.4 (0–2) 0.2	14 (45.2)	17 (54.8)	15 (48.4)
	p		0.782[a]	0.407[a]	0.781[a]	0.795[a]	0.111[b]	0.163[b]	0.669[b]
Does your genitalia make you uncomfortable when wearing tight-fitting clothing?	Yes	23 (20.4)	3.1 ± 1.4 (1.4-6) 3.5	1.7 ± 1.0 (0.4–4.2) 1.5	0.4 ± 0.4 (0-1.1) 0.2	0.4 ± 0.4 (0-1.5) 0.2	6 (26.1)	12 (52.2)	9 (39.1)
	No	90 (79.6)	3.4 ± 1.1 (0.9-7) 3.5	1.7 ± 0.9 (0.5-6) 1.5	0.4 ± 0.4 (0–2) 0.3	0.3 ± 0.5 (0–3) 0.2	32 (35.6)	38 (42.2)	42 (46.7)
	p		0.218[a]	0.782[a]	0.965[a]	0.391[a]	0.391[b]	0.391[b]	0.517[b]

[a] Mann- Whitney U Test, [b] Pearson Chi-Square Test, [c] Fisher's Exact Test

Table 5
The relationship of Self-perception and Examination findings to the desire to have genital aesthetics and the anxiety of receiving negative feedback from the partner.

		Self-perception			Examination findings			Wants genital aesthetic surgery
		Abnormal	Large	Dissatisfied	Asymmetry	Hyperpigmentation	Protusion	
Are you concerned about receiving negative feedback regarding the appearance of your genitalia from your male partner?	Yes, (n = 20)	5 (25)	6 (30)	10 (50)	11 (55)	7 (35)	9 (45)	9 (45)
	No, (n = 79)	6 (7.6)	7 (8.9)	17 (21.5)	32 (40.5)	28 (35.4)	35 (44.3)	5 (6.3)
	p value	0.027 X^2 = 4.895	0.012 X^2 = 6.252	0.011 X^2 = 6.527	0.243 X^2 = 1.365	0.970 X^2 = 0.001	0.955 X^2 = 0.003	< 0.001 X^2 = 19.657
Do you want to have genital aesthetic surgery?	Yes, (n = 15)	7 (50)	5 (7.1)	9 (64.3)	12 (85.7)	5 (35.7)	7 (50)	
	No, (n = 97)	4 (4.7)	5 (5.9)	18 (21.2)	31 (36.5)	30 (35.3)	37 (43.5)	
	p value	< 0.001 X^2 = 24.968	< 0.001 X^2 = 27.689	0.001 X^2 = 11.262	0.001 X^2 = 11.864	0.976 X^2 = 0.001	0.652 X^2 = 0.204	

Pearson Chi-Square Test was used

In the statistical analysis of labia minora measurements, protrusion was not associated with base and width measurements, differences between the two labia minora, or asymmetry in these two measurements ($p > 0.05$), but was associated with hyperpigmentation ($p = 0.041$). Both base and width measurements were significantly larger in participants with labia minora The measurements and examination findings of volunteers with asymmetry and protrusion were given in Table 6. Comparison of examination findings of volunteers, obstetric and gynecological information were given in Table 7.

Table 6
The relationship of Self-perception, the desire to have genital aesthetics and the anxiety of receiving negative feedback from the partner to age and education

		Age (years), n(%)			Education (years), n(%)		
	n (%)	≤ 40	> 40	p	≤ 12, n = 47	> 12, n = 66	p
Self-perception	Abnormal, 12 (10.6)	11 (91.7)	1 (8.3)	0.028[a] X^2 = 4.537	6 (50)	6 (50)	0.532 X^2 = 0.391
	Large, 14 (12.4)	12 (85.7)	2 (14.3)	0.058[a] X^2 = 3.345	6 (42.9)	8 (57.1)	0.918 X^2 = 0.011
	Satisfied, 82 (72.6)	47 (65.3)	35 (85.4)	0.021 X^2 = 5.295	38 (46.3)	44 (53.7)	0.096 X^2 = 2.774
Concerned about negative feedback about genital appearance from male partner, n = 20		13 (65)	7 (35)	0.581 X^2 = 0.304	5 (25)	15 (75)	0.050 X^2 = 3.838
Would like to have genital aesthetic surgery, n = 15		12 (80)	3 (20)	0.140 X^2 = 1.863	3 (20)	12 (80)	0.055[a] X^2 = 3.431

[a] Fisher's Exact Test

Table 7
The measurements and examination findings of volunteers with asymmetry and protrusion

	n (%)	Base, *Mean ± SD (range) median* (cm)	Width, *Mean ± SD (range) median* (cm)	Base difference, *Mean ± SD (range) median* (cm)	Width difference, *Mean ± SD (range) median* (cm)	Hyperpigmentation, n (%)	Asymmetry, n (%)
Labia minora protusion	Yes, 51 (45.1)	3.3 ± 1.2 (0.9-6) 3.5	1.5 ± 0.38 (0.4–4.2) 1.5	0.4 ± 0.4 (0–2) 0.3	0.3 ± 0.4 (0–2) 0.2	22 (57.9)	18 (36)
	No, 62 (54.9)	3.5 ± 1.1 (1.4-7) 3.5	1.8 ± 1.0 (0.4-6) 1.5	0.4 ± 0.4 (0-1.6) 0.2	0.4 ± 0.5 (0–3) 0.3	16 (42.1)	32 (64)
	p	0.363*	0.164*	0.598 [a]	0.510 [a]	0.041[b] X^2 = 3.766	0.082[b] X^2 = 3.021
Labia minora asymmetry	Yes, 50 (44.2)	3.7 ± 1.1 (1.5-7) 3.7	2.1 ± 1 (0.5-6) 2	0.6 ± 0.5 (0–2) 0.5	0.6 ± 0.6 (0–3) 0.5	20 (52.6)	
	No, 63 (55.8)	3.1 ± 1.1 (0.9-6) 3	1.3 ± 0.6 (0.4–3.5) 1.2	0.2 ± 0.2 (0–1) 0.2	0.1 ± 0.2 (0-0.5) 0.1	18 (47.4)	
	p	0.003[a]	< 0.001[a]	< 0.001[a]	< 0.001[a]	0.202[b] X^2 = 1.631	

[a] Mann- Whitney U Test, [b] Pearson Chi-Square Test

Table 8
, Comparison of examination findings of volunteers, obstetric and gynecological information

		Base, Mean ± SD (range) Median (cm)	Width, Mean ± SD (range) Median (cm)	Base difference, Mean ± SD (range) Median (cm)	Width difference, Mean ± SD (range) Median (cm)	Hyperpigmentation n (%)	Asymmetry n (%)	Protusion n (%)
BMI	≤ 24.9, n = 51	3.2 ± 1.3 (0.9-7) 3	1.7 ± 0.9 (0.4–4.2) 1.5	0.3 ± 0.4 (0-1.6) 0.2	0.3 ± 0.3 (0–1) 0.1	14 (27.5)	19 (37.3)	26 (51)
	25-29.9, n = 31	3.5 ± 0.9 (1.5-6) 3.5	1.7 ± 0.7 (0.5–3.5) 1.5	0.5 ± 0.6 (0–2) 0.2	0.5 ± 0.5 (0–2) 0.3	11 (35.5)	14 (45.2)	17 (54.8)
	≥ 30, n = 23	3.5 ± 1.2 (1.5-6) 4	1.9 ± 1.3 (0.5-6) 1.5	0.4 ± 0.4 (0–1) 0.4	0.4 ± 0.6 (0–3) 0.3	9 (39.1)	16 (69.6)	2 (8.7)
	p	0.354[a]	0.853 [a]	0.458 [a]	0.126 [a]	0.554[b]	0.035[b]	0.001[b]
Age at first sexual intercourse (years)	≤ 20, n = 53	3.3 ± 1.1 (0.9-6) 3.5	1.7 ± 0.9 (0.4–4.2) 1.5	0.4 ± 0.4 (0-1.6) 0.2	0.4 ± 0.4 (0–2) 0.2	19 (35.8)	30 (56.6)	17 (32.1)
	≥ 21, n = 60	3.4 ± 1.2 (1.4-7) 3.5	1.6 ± 0.9 (0.5-6) 1.5	0.4 ± 0.4 (0–2) 0.3	0.3 ± 0.5 (0–3) 0.2	19 (31.7)	20 (33.3)	34 (56.7)
	p	0.599[c]	0.683[c]	0.939[c]	0.939[c]	0.639[b]	0.013[b]	0.009[b]
Virgin	Yes, n = 19	3.2 ± 1.3 (1.4-6) 3.5	1.8 ± 1.2 (0.4–4.2) 1.5	0.4 ± 0.5 (0-1.6) 0.2	0.4 ± 0.5 (0–2) 0.2	6 (31.6)	11 (57.9)	10 (52.6)
	No, n = 94	2.4 ± 1.1 (0.9-7) 3.5	1.7 ± 0.9 (0.5-6) 1.5	0.4 ± 0.4 (0–2) 0.3	0.3 ± 0.4 (0–3) 0.2	32 (34)	39 (41.5)	41 (43.6)
	p	0.416[c]	0.994[c]	0.822[c]	0.759[c]	0.836[b]	0.189[b]	0.471[b]
Gravida	Yes, n = 72	3.4 ± 1.1 (1.4-7) 3.5	1.7 ± 0.9 (0.5-6) 1.5	0.4 ± 0.4 (0–2) 0.4	0.4 ± 0.5 (0–3) 0.3	25 (34.7)	33 (45.8)	27 (37.5)
	No, n = 41	3.3 ± 1.2 (0.9-6) 3.5	1.7 ± 0.9 (0.4–4.2) 1.6	0.3 ± 0.4 (0-1.6) 0.2	0.3 ± 0.4 (0–2) 0.1	13 (31.7)	17 (41.5)	24 (58.5)
	p	0.929[c]	0.447[c]	0.182[c]	129[c]	0.744[b]	0.653[b]	0.031[b]

[a] Kruskal-Wallis Test, [b] Pearson Chi-Square Test, [c] Mann- Whitney U Test

		Base, Mean ± SD (range) Median (cm)	Width, Mean ± SD (range) Median (cm)	Base difference, Mean ± SD (range) Median (cm)	Width difference, Mean ± SD (range) Median (cm)	Hyperpigmentation n (%)	Asymmetry n (%)	Protusion n (%)
Parity	None, n = 47	3.4 ± 1.3 (0.9-7) 3.5	1.8 ± 0.9 (0.4–4.2) 1.6	0.4 ± 0.4 (0-1.6) 0.2	0.3 ± 0.4 (0–2) 0.1	15 (32.6)	21 (45.7)	25 (54.3)
	1, n = 18	2.8 ± 0.8 (1.5-4) 3	1.5 ± 1.3 (0.6-6) 1.1	0.3 ± 0.3 (0–1) 0.4	0.4 ± 0.7 (0–3) 0.2	6 (33.3)	3 (16.7)	9 (50)
	≥ 2, n = 23	3.6 ± 0.8 (2.4–5.1) 3.5	1.8 ± 0.8 (0.5-3) 1.6	0.4 ± 0.4 (0–1) 0.5	0.4 ± 0.4 (0-1.5) 0.4	11 (47.8)	14 (60.9)	3 (13)
	p	0.044[a]	0.105[a]	0.690 [a]	0.465 [a]	0.440[b]	0.017[b]	0.004[b]
Sexual activity	Active, n = 87	3.4 ± 1.1 (0.9-7) 3.5	1.7 ± 0.9 (0.5-6) 1.5	0.4 ± 0.4 (0–2) 0.3	0.4 ± 0.5 (0–3) 0.2	31 (35.6)	37 (42.5)	37 (42.5)
	Inactive, n = 26	3.1 ± 1.2 (1.4-6) 3.3	1.7 ± 1.2 (0.4–4.2) 1.5	0.4 ± 0.5 (0-1.6) 0.2	0.3 ± 0.4 (0–2) 0.2	7 (26.9)	13 (50)	14 (53.8)
	p	0.261[c]	0.521[c]	0.980[c]	0.445[c]	0.409[b]	0.501[b]	0.309[b]
Age (years)	≤ 40, n = 72	3.2 ± 1.1 (1.4-7) 3	1.7 ± 0.8 (0.4–4.2) 1.5	0.4 ± 0.4 (0–2) 0.2	0.3 ± 0.4 (0–2) 0.2	24 (33.3)	28 (38.9)	40 (55.6)
	> 40, n = 41	3.6 ± 1.2 (0.9-6) 4	1.7 ± 1.1 (0.5-6) 1.5	0.4 ± 0.4 (0-1.5) 0.3	0.5 ± 0.6 (0–3) 0.3	14 (34.1)	22 (53.7)	11 (26.8)
	p	0.067[c]	0.957[c]	0.606[c]	0.091[c]	0.930[b]	0.129[b]	0.003[b]
Duration of menstruation (days)	≤ 5, n = 43	3.4 ± 1.3 (1.4-7) 3	1.6 ± 1.1 (0.5-6) 1.4	0.3 ± 0.3 (0-1.1) 1.2	0.2 ± 0.5 (0–3) 0.1	13 (30.2)	12 (27.9)	20 (46.5)

[a] Kruskal-Wallis Test, [b] Pearson Chi-Square Test, [c] Mann- Whitney U Test

		Base, Mean ± SD (range) Median (cm)	Width, Mean ± SD (range) Median (cm)	Base difference, Mean ± SD (range) Median (cm)	Width difference, Mean ± SD (range) Median (cm)	Hyperpigmentation n (%)	Asymmetry n (%)	Protusion n (%)
	≥ 6, n = 38	3.3 ± 1.2 (1.4-6) 3.5	1.6 ± 0.8 (0.4–3.5) 1.5	0.5 ± 0.5 (0–2) 0.5	0.4 ± 0.5 (0–2) 0.4	12 (31.6)	20 (52.69)	19 (50)
	p	0.864[c]	0.614[c]	0.061[c]	0.018[c]	0.896[b]	0.023[b]	0.754[b]
Total pad usage (n)	≤ 20, n = 43	3.3 ± 1.1 (1.5-6) 3.5	1.5 ± 0.8 (0.5–4.2) 1.4	0.3 ± 0.3 (0-1.5) 0.2	0.2 ± 0.3 (0–1) 0.1	13 (30.2)	12 (27.9)	24 (55.8)
	> 20, n = 38	3.4 ± 1.2 (0.9-7) 3.5	1.8 ± 1 (0.4-6) 1.6	0.5 ± 0.5 (0–2) 0.5	0.4 ± 0.5 (0–3) 0.3	12 (31.6)	20 (52.6)	15 (39.5)
	p	0.870[c]	0.123 [c]	0.124 [c]	0.018 [c]	0.896[b]	0.023[b]	0.142[b]
Estrogen exposure (years)***	≤ 20, n = 41	3.4 ± 1.1 (1.4-7) 3.5	1.7 ± 0.8 (0.4–4.2) 1.5	0.4 ± 0.5 (0–2) 0.2	0.2 ± 0.3 (0–1) 0.1	11 (26.8)	16 (39.0)	20 (48.8)
	21–30, n = 36	3.0 ± 1.2 (0.9-6) 3	1.5 ± 0.9 (0.5–4.2) 1.3	0.4 ± 0.4 (0.1.5) 0.2	0.3 ± 0.54 (0–2) 0.2	13 (36.1)	14 (38.9)	22 (61.1)
	≥ 31, n = 27	3.6 ± 0.9 (1.5-5) 4	1.8 ± 1.1 (0.5-6) 1.5	0.4 ± 0.4 (0-1.5) 0.3	0.6 ± 0.6 (0–3) 0.5	7 (25.9)	16 (59.3)	4 (14.8)
	p	0.025[a]	0.258[a]	0.887[a]	0.022[a]	0.591[b]	0.188[b]	0.001[b]
Mode of delivery	None, n = 46 (40.7)	3.4 ± 1.2 (1.4-7) 3.5	1.8 ± 1.0 (0.4–4.2) 1.6	0.4 ± 0.4 (0-1.6) 0.2	0.3 ± 0.4 (0–2) 0.1	15 (32.6)	21 (45.7)	25 (54.3)
	Normal vaginal delivery, n = 31 (27.5)	3.5 ± 1.0 (0.9–5.1) 3.5	1.7 ± 0.8 (0.5-3) 1.5	0.4 ± 0.3 (0–1) 0.3	0.4 ± 0.3 (0–1) 0.3	10 (32.3)	17 (54.8)	8 (25.8)

[a] Kruskal-Wallis Test, [b] Pearson Chi-Square Test, [c] Mann- Whitney U Test

		Base, Mean ± SD (range) Median (cm)	Width, Mean ± SD (range) Median (cm)	Base difference, Mean ± SD (range) Median (cm)	Width difference, Mean ± SD (range) Median (cm)	Hyperpigmentation n (%)	Asymmetry n (%)	Protusion n (%)
	Caesarean section, n = 30 (26.5)	3.1 ± 1.2 (1.4-6) 3	1.5 ± 1.1 (0.5-6) 1.2	0.4 ± 0.6 (0–3) 0.2	0.4 ± 0.6 (0–3) 0.2	9 (30)	7 (23.3)	18 (60)
	p	0.227[a]	0.102[a]	0.811[a]	0.274[a]	0.970[b]	0.036[b]	0.014[b]
Perineal body, n = 99	≤ 1 cm	3.0 ± 1.1 (0.9–4.6) 3	1.3 ± 0.7 (0.4-3) 1.4	0.4 ± 0.2 (0–1) 0.5	0.2 ± 0.2 (0-0.8) 0.2	13 (39.4)	8 (24.2)	22 (66.7)
	> 1 cm	3.6 ± 1.0 (1.5-6) 3.5	1.9 ± 1.0 (0.5-6) 1.7	0.4 ± 0.5 (0–2) 0.3	0.4 ± 0.5 (0–3) 0.3	21 (31.8)	37 (56.1)	24 (36.4)
	p	0.012[c]	0.004[c]	0.764[c]	0.152[c]	0.454[b]	0.003[b]	0.004[b]

[a] Kruskal-Wallis Test, [b] Pearson Chi-Square Test, [c] Mann- Whitney U Test

Discussion

Many studies have been conducted to determine the criteria for normality of the female external genitalia. The measurements made in most of these studies span a wide range, varying according to ethnicity, age, weight, hormonal status, and skin type (13). Regardless, surgeons dealing with genital aesthetics need a definition of the ideal vulva.

However, our medical definition of normal and self-perceptions of normality do not always coincide, especially with the external genitalia. Criteria for the aesthetic ideal can be defined simply as symmetrical labia minora that do not extend beyond the labia majora (16).

On physical examination, labia minora protrusion was detected in 45.1% and asymmetry in 42.5% of the participants in our study. However, despite this high rate, only 10.6% of them defined their genital area as abnormal. Normal is defined in dictionary as conforming to a standard; usual, typical, or expected whereas ideal is defined as existing only in the imagination or perfection but not likely to become a reality (17). Considering these rates, asymmetry and protrusion could be considered normal. In the literature, protusion rates are reported above 50% (9, 21). The values defined as normal in the literature actually seem to be ideal vulva criteria.

Labia minora hypertrophy can be most simply defined as labia minora that protrude beyond the labia majora. It can affect only one side or both labia (18). Classification systems to describe labia minora hypertrophy have been published (19, 20). These classification systems are generally based on width measurements of the labia minora. Although useful for surgical algorithms, their role in defining hypertrophy is controversial. A study evaluating perceptions of genital appearance in women indicated that the normal labial appearance was highly variable and the extent of physical and psychological complaints was not associated with objective measurements of the labia minora. Therefore, the term “labial hypertrophy” and the use of terms such as “normal” and “pathological” labial size were not recommended. The authors emphasized that it was not possible to define specific threshold values for these terms that could be associated with complaints (9). In our study, we observed that labia minora protrusion was not associated with base and width measurements of labia minora, the differences in these measurements between the two labia minora, or asymmetry. To accept the genitalia as ideal or within aesthetic limits, it would not be right to define certain criteria for the labia minora alone while ignoring the other structures. The genital region is a whole and its evaluation should include all relevant anatomical structures. Hypertrophy or ptosis of the labia major may cause them to completely cover the labia minora. However, to what degree can the resulting genital configuration be considered ideal or aesthetically pleasing? The main person who evaluates these ideals and aesthetic concepts is the individual themselves. Considering that aesthetic surgery is a personal desire, it seems that self-perception is the most important factor. In one study it was reported that 54% of women had labia minora protrusion, but only 17.3% of these women regarded their labia minora as abnormal. In contrast, 7.3% of the women without protrusion evaluated their labia minor as

abnormal (21). In another study, when asked for their subjective perceptions, 65% of the women said they considered their labia minora to be normal, while approximately one-third considered them too large. In the same study, the prevalence of labia minora protrusion was 56%, and objective labia size was significantly associated with the women's subjective perceptions of labia size but not with self-reported complaints (9). Lykkebo et al. also reported that women who considered their genitalia abnormal had a higher frequency of visible labia minora and larger labia sizes, but the differences were not statistically significant (21). In our study, the prevalence of labial minora protrusion on examination was 45.1%, yet only 15.7% of the participants with protrusion considered their genitalia to be abnormal. The other 84.3% said they perceived it as normal. Overall, 10.6% of the participants reported self-perceived abnormality and 27.4% were dissatisfied with the appearance of their genitalia. The difference between these two percentages suggests that there is a population of women who perceive their genitalia as normal but are not satisfied for some reason. In our study, we observed that self-perception of the genitalia being normal in appearance and size was associated with asymmetry of the labia minora and hyperpigmentation, but not with labia minora measurements or protrusion.

Lykkebo et al. also emphasized that although age difference did not have a significant effect on perception, most women who considered their genitals abnormal were younger (21). In the present study, self-perceived abnormality and dissatisfaction were more common in participants under the age of 40 than in participants over the age of 40. In addition, we determined that satisfaction was not associated with measurements, asymmetry, or protrusion. A reason for this difference observed in our series could be that the under-40 population in our society has greater interest in the online and social media environment and has easier access to information there. In addition, cultural and social differences may influence the relationship between age and genital perception. However, education level had no effect on self-perception or satisfaction in our study.

In the literature there is another series in which percentages of complaints of their labia minora were relatively higher (%27), and the reported rate of labial protrusion in that study was 56% (9). The prevalence of labia minora protrusion in our study was 45%, while the proportion of women reporting physiological, functional, or psychological problems associated with their genitalia was low. These studies were conducted in different populations, and differences between these populations in lifestyle, sports habits, and clothing preferences may lead to different physiological, functional, and psychological problems despite the similar prevalence of labial protrusion.

Labia minora hypertrophy is most often idiopathic in etiology (22). However, it may also be congenital. Enlargement may be present from birth, but usually becomes most apparent when the woman enters adolescence (23). In our study, 82.3% of the participants stated that their genitalia had not changed and appeared the same for as long as they could remember, while 17.7% reported that their genitalia had changed over time. An individual's awareness of the genitals varies according to the value judgments and views of sexuality of the society in which they live. The genitalia change and mature during puberty, and particularly in traditionalist societies, it may not be possible for people to become aware of and visually examine their genitalia and recognize these developmental changes. Therefore, this distinction between congenital and acquired may not be accurate.

The size of the labia minora has been reported to be independent of the woman's age, parity, ethnicity, hormone use, and history of sexual activity. The size of the labia changes over time, with the most significant increase during puberty, and can reportedly be increased with external stimuli such as stretching with weights (24–26). It has been reported that in some African countries, the labia minora can reach 20 cm in size with direct manipulation (24). Other causes of hypertrophy include androgenic hormone exposure in infancy, sensitivity to topical estrogen, dermatitis secondary to urinary incontinence, vulvar lymphedema, and myelodysplastic diseases. Some also believe that the recurrent stretching that can occur with multiple pregnancies may also contribute to labial hypertrophy (27).

However, in our study, we observed that protrusion was more common among nulligravida women compared to gravid women. The prevalence of protrusion was also lower among women who had normal vaginal delivery than in those who had delivered by cesarean section. Again, protrusion was more common in nulliparous and uniparous women, and asymmetry was more common among multiparous women. If factors such as stretching and trauma caused labial hypertrophy, labial protrusion would be expected in participants with a history of vaginal delivery and multiple births. However, the opposite was observed in our study. Our finding that labial asymmetry was more common among multiparous women but was not associated with mode of delivery suggests that this may be a result of hormonal effects.

Lykkebo et al. found no statistical relationship between labia minora measurements and age or parity but detect a significant relationship with BMI. They found that women with high BMI had smaller labia minora (21). In our study, asymmetry was more frequent among participants with a BMI of 30 or higher, while labia minora protrusion was less frequent. As labia minora measurements are not affected by BMI, the low level of protrusion is likely due to fat accumulation in the labia majora increasing their length and resulting in better coverage of the labia minora. However, this does not explain why these women appear to have more asymmetry.

In addition, despite claims that excessive sexual activity cause labia minora hypertrophy, this has not been proven (23, 28). In our study, we asked the participants about their age at first sexual intercourse. Although participants with a first sexual experience before the age of 20 were expected to have a higher rate of labial hypertrophy due to the early onset of sexual intercourse trauma, we actually found that asymmetry

was more common in this age group, while contrary to expectation, protrusion was more common in participants who were over 20 years of age at first sexual intercourse. There was no difference between participants with and without a history of sexual intercourse in terms of anatomical measurements or aesthetic perceptions. These results indicate that labia minora hypertrophy is not significantly associated with sexual intercourse. In our society, women in particular are assumed to be monogamous, or those with more than one partner avoid expressing this. Therefore, the concepts of multi-partner women or excessive sexual activity were not examined in this study.

Participants whose reported duration of menstruation was 6 days or more showed greater labial asymmetry and differences in width between the labia when compared with individuals with a menstrual period of less than 5 days. The same relationship was observed in the group with total pad use of 20 or less compared to the group using over 20 pads. This may be due to moisture in the genital area during menstruation or irritation caused by the pads used, or it may be related to hormonal effects.

In our study, we determined that participants with more than 31 years of estrogen exposure had greater differences in base length and widths between the labia minora but less protrusion. The lack of protrusion may be because the labia majora undergo hypertrophy in response to estrogen, thereby providing better coverage of the labia minora. Labia majora asymmetry in adolescents is thought to result from asymmetric physiological enlargement as a hormonal response, and it can reportedly regress (29).

However, these two complementary structures develop from the same embryonic structures and are expected to be symmetrical, and it does not seem possible to attribute their asymmetry in adults to a single cause. It is likely a multifactorial condition.

When we evaluated anatomical relationships, we found that labia minora base and width measurements were larger in participants with perineal body measurements greater than 1 cm, while protrusion was more common in participants whose perineal body measured 1 cm or smaller. We believe that genital anatomy is a structure with certain proportions between its components, as well as a region that shows individual differences, like the face. For this reason, the appearance of the genitalia is as personal as the face, and an individual's self-perception is more important than our ideal.

In addition, we observed that both base and width measurements and the differences between the two labia were found to be greater in participants with labia minora asymmetry than in those with symmetrical labia minora. Asymmetry arises not only from one labium being larger than the other, but is also due to the general size of the labium. This information should be considered In conclusion, although there is a tendency in the field of aesthetic surgery to define ideals and aesthetic standards for all parts of the body, our definitions of normality do not always coincide with those of the individual. Although the aesthetic criteria we define and our efforts to classify the abnormal are indispensable for the surgical literature and correct surgical approaches to the genital area, they seem meaningless in defining what is abnormal. The results of our study indicate that a woman being satisfied with her body and receiving no negative feedback from their male partner creates her perception of normal. Moreover, the high satisfaction rate of 72% in our study may be related to the fact that only 4 of the participants received negative feedback from their male partner. Like the face, the genitals also seem to be a region of individuality. As in all other aesthetic approaches, there should be certain definitions in genital aesthetics. The criterias defined by the professionals are different from the non-professional individual.

Declarations

- **Ethical Approval and Consent to participate** Ethics committee approval for the study was obtained from the local ethics committee of Sivas Cumhuriyet University. (No: 2021-08/56, date: 19.08.2021)

- Competing interests: The authors have no conficts of interest to declare.

- Funding: No financial assistancent were received.

- **Informed consent**: Consent is obtained from our patients that their data will be used in the studies.

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