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RESEARCH ARTICLE

Perception and satisfaction with the scar in women undergoing cesarean section: Descriptive study

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Abstract

Background: The high rate of cesarean sections has contributed to an increase in the number of women with abdominal scars, which may impact physical, esthetic, and psychosocial aspects. However, perceptions and satisfaction with the scar remain underexplored in the literature. **Objective:** To describe women's perceptions of and satisfaction with their scars after cesarean section. **Methods:** This descriptive, observational, cross-sectional study used a quantitative approach and included 24 women aged 18 to 55 years who had undergone cesarean section at least six months earlier. Data were collected between March and August 2024 through a structured interview and the Patient Scar Assessment Questionnaire (PSAQ-BR), which assesses scar appearance, symptoms, perception, and satisfaction. Data were analyzed using descriptive statistics. **Results:** Participants reported an overall positive perception of the scar, with greater impact in the appearance and satisfaction-with-appearance domains. Most participants reported low symptom frequency and intensity, with numbness as the most relevant symptom. Regarding esthetic aspects, color, length, and texture were the main factors associated with dissatisfaction. Although 62.5% of women were satisfied with the scar's appearance, 37.5% reported some dissatisfaction. Most participants reported no discomfort and minimal impact on social life, though individual experiences varied. **Conclusions:** Cesarean section scars affect women's perception and satisfaction, particularly regarding esthetic aspects. Although physical symptoms are generally mild, scar appearance plays a central role in body image, reinforcing the importance of a clinical approach that considers physical, esthetic, and psychosocial dimensions in postpartum care.

Keywords: Cesarean Section; cicatrix; perception; personal satisfaction; body image.

BACKGROUND

The World Health Organization (WHO), based on previous studies, estimates that 21.1% of births occurred by cesarean section. In Brazil, this proportion reached 50.1% in 2009, surpassing vaginal births for the first time and continuing to rise to approximately 57% in 2023, according to data from the Live Births Information System (SINASC)[1, 2]. In this scenario, the Pfannenstiel incision is the most commonly used surgical technique, resulting in abdominal scars[3] whose appearance varies with the time and quality of the healing process[4-6].

Tissue repair aims to restore the function and appearance of the skin, with the expectation that the balance between collagen synthesis and degradation will favor the formation of normotrophic scars[7,8]. However, imbalances in this process can result in hypertrophic, keloid, or atrophic scars, associated with the inadequate organization of collagen fibers, tissue adhesions, and loss of dermal volume, manifesting symptoms such as pain, itching, pulling, and increased sensitivity[6, 9-11]. These alterations not only compromise esthetics but also affect tissue function, potentially causing movement restrictions, chronic discomfort, and reduced quality of life[12, 13].

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Beyond physical effects, scars can influence body image, a multidimensional construct involving physiological, psychological, and social dimensions. Living with scars can be challenging, even when they are not visible or extensive, generating esthetic, psychological, and social impacts[14-16]. In the context of cesarean section, perceptions such as strangeness regarding one's own image, a sense of mutilation, and a feeling of difference compared to other women may emerge in the postpartum period, with repercussions on daily activities and social participation[17, 18].

Despite this, the functional impacts of healing after a cesarean section, as well as women's perceptions and satisfaction regarding the scar, are still underexplored in the literature[9]. Considering the high prevalence of this procedure and its relevance to well-being and quality of life, it becomes essential to understand these aspects to support a comprehensive clinical approach in the postpartum period. Thus, this study aims to describe perceptions of and satisfaction with the scar in women who underwent cesarean section, using the Patient Scar Assessment Questionnaire (PSAQ-BR).

METHODS

Study Design and Participants

Descriptive and observational study, with a cross-sectional design and quantitative approach, part of a larger research titled "Evaluation of the Characteristics of Cesarean Scars in Women Satisfied and Dissatisfied with the Appearance of Healing," approved by the Human Research Ethics Committee (CEP) of the State University of Santa Catarina (UDESC), under opinion number 6.783.886 (CAAE 77218923.9.0000.0118). Data collection was conducted between March and August 2024, at the Biomechanics Laboratory of the Center for Health and Sports Sciences – CEFID/UDESC.

Sampling was non-probabilistic and purposive, based on eligibility criteria. Inclusion criteria: women aged 18 to 55 years who underwent a cesarean section at least six months before the evaluation and resided in Greater Florianópolis. Exclusion criteria: pregnant women, women with previous esthetic or surgical procedures on the scar, those with open lesions in the scar area, those with a history of abdominal surgery or radiotherapy after cesarean section, self-reported orthopedic and/or neurological diseases that could affect pelvic and lower limb mobility, those who did not understand or articulate Brazilian Portuguese.

Data collection procedures

The research team recruited participants through social media promotion (Instagram). Interested women contacted the research team to schedule an in-person evaluation, based on availability. Those who met the inclusion criteria received study information and signed the Informed Consent Form (ICF).

Initially, an interview was conducted using an evaluation form, covering sociodemographic data (age, self-reported skin color, marital status, education, and profession), obstetric history (number of pregnancies and births), and information related to cesarean section (time since the last birth, gestational age, newborn weight, and surgical conditions). We also collected data on physical activity through self-report,

along with anthropometric measurements (height and body mass) to calculate body mass index (BMI) (kg/m²).

Next, we administered the PSAQ-BR, translated and validated for Brazilian Portuguese, to assess women's perception of the surgical scar and its impact on quality of life[19]. The instrument consists of 39 items distributed across five domains: appearance (10 items), symptoms (7 items), perception (7 items), satisfaction with appearance (9 items), and satisfaction with symptoms (6 items), in addition to a global assessment item not included in the domain scores. The responses are presented on a four-point categorical scale, and the total score ranges from 34 to 152, with higher values indicating worse perception and satisfaction regarding the scar[19].

For this study, the domains were analyzed individually, considering aspects related to the appearance of the scar (color, extent, relief, and texture), presence of symptoms (pain, itching, discomfort, and sensory changes), individual perception and visibility of the scar, as well as the degree of satisfaction with the appearance and symptoms.

Statistical analysis

We stored the data in a Microsoft Excel spreadsheet, with participants identified numerically to ensure anonymity. We conducted descriptive analyses using Microsoft Excel and IBM SPSS software (version 20.0).

The sociodemographic variables, obstetric history, lifestyle habits, anthropometric data, and scores of the PSAQ-BR domains, as well as concepts related to the dimensions of each, were analyzed using descriptive statistics, presented as absolute and relative frequencies (categorical variables) and mean, standard deviation, minimum and maximum values (numerical variables).

The total and domain scores of the PSAQ-BR ("Appearance," "Symptoms," "Perception," "Satisfaction with appearance," and "Satisfaction with symptoms") were also considered, in addition to the percentage distribution of responses for each item (dimensions), evaluated on a scale of 1 to 4. The results were also presented through graphical representations of the percentage distributions by dimension in each domain.

RESULTS

This study evaluated 24 women. Table 1 presents the sample characteristics: an average age of 40.3 years, an average of six years since the last cesarean section, and a median of one cesarean section per participant. The other data are described in Table 1.

Table 1. Sociodemographic characteristics, birth history, lifestyle habits, and anthropometric data of the participants (N=24)

Variable	Mean (±SD) * / Median [Min-Max] ** n (%)
Age (years)	40,3 (±10,2)
Marital status	
Married	16 (66,6)
Single	5 (20,8)
Separated	1 (4,2)

Divorced	1 (4,2)
Stable union	1 (4,2)
Self-reported skin color	
White	21 (87,5)
Black	2 (8,3)
Brown	1 (4,2)
Education	
Incomplete high school	2 (8,3)
High school diploma	7 (29,2)
Incomplete higher education	2 (8,3)
Complete higher education	4 (16,7)
Postgraduate	9 (37,5)
Profession	
Salaried	11 (45,8)
Freelance work	5 (20,8)
From home	4 (16,7)
Unemployed	3 (12,5)
Retired	1 (4,2)
Number of pregnancies	1,0 [1,0-5,0]
Number of vaginal births	0,00 [0,0-1,0]
Number of cesarean births	1,0 [1,0-3,0]
Time of cesarean delivery (years)#	6,0 [0,6-27,2]
Gestational age related to cesarean delivery (weeks) #	39 [26-42]
Condition of the surgery performed#	
Emergency	15 (62,5)
Elective	9 (37,5)
Weight of the newborn (kg)#	3,1 (±0,6)
Physical activity	
No	10 (41,7)
Yes	14 (58,3)
Body mass (kg)	88,0 [52,9-100,0]
Body mass index	
Normal	11 (45,8)
Overweight	8 (33,4)
Obesity grade I	5 (20,8)

Note: Numerical variables presented as: *Mean ± SD - standard deviation, for continuous variables with normal distribution; **Median [Min-Max] - minimum-maximum value, for continuous variables with non-normal distribution; categorical variables presented as: n - absolute frequency, % - percentage; # - considered the last cesarean delivery; kg – kilograms.

Table 2 presents the average scores of the PSAQ-BR domains. The highest averages were observed in the domains "Appearance" and "Satisfaction with appearance." The average total score was 68.8 (±19.8), with values ranging from 38 to 124, within a

possible range of 34 to 152; higher values indicate worse perception and satisfaction with the scar. Table 2 presents the other data.

Table 2. PSAQ-BR Domains (N=24)

Domains	Mean (±SD) / Median [Min-Max] * n (%) **
Appearance of the scar	17,4 (±4,0) / 17 [9-25]
Symptoms of the scar	14,8 (±5,3) / 14,5 [10-32]
Perception of the scar	10,8 (±4,0) / 10 [6-22]
Satisfaction with the appearance of the scar	16,6 (±4,9) / 15,5 [8-26]
Satisfaction with scar symptoms	9,2 (±4,1) / 9,5 [5-19]
Total score	68,8 (±19,8) / 66,0 [38-124]
Appearance of the scar#	
Excellent	2 (8,3)
Good	7 (29,2)
Normal	6 (25,0)
Bad	7 (29,2)
Very bad	2 (8,3)
Scar causes discomfort#	
None	12 (50,0)
A little	8 (33,3)
Quite a bit	3 (12,5)
Very	1(4,2)
Unbearable	0 (0,0)
Satisfaction with the appearance of the scar#	
Not at all	15 (62,5)
A little	8 (33,3)
Quite a bit	0 (0,0)
Very	1 (4,2)
Satisfaction with the appearance of the scar#	
Very satisfied	6 (25,0)
Satisfied	9 (37,5)
Dissatisfied	6 (25,0)
Very dissatisfied	3 (12,5)
Satisfaction with the appearance of the scar#	
Very satisfied	8 (33,3)
Satisfied	8 (33,3)
Dissatisfied	5 (20,8)
Very dissatisfied	3 (12,5)

Note: Numerical variables presented as: * Mean ± SD - standard deviation; median and [Min-Max] - minimum-maximum value; **Categorical variables presented as: n - absolute frequency, % - percentage; µ - subjective questions from the PSAQ-Br that do not contribute to the score.

Regarding the dimensions of the "Appearance" domain of the scar (Figure 1.a), a predominance of classifications in scales 1 and 2 was observed, indicating adequacy or minimal alteration in most of the evaluated aspects. For specific aspects, 41.7% of women reported low correspondence between scar color and adjacent skin, while 70.8% observed a difference in tone (lighter or darker than the skin).

Regarding size, 50% classified the scar as relatively small and 37.5% as large. Most participants described the scar as thin (75%) and smooth (66.7%), with 50% reporting no hardening. Finally, in the global subjective assessment (Table 2), 29.2% of participants rated the scar's appearance as "good," while the same proportion rated it "bad."

As shown in Figure 1b, the "Symptoms" domain had lower scores than the "Appearance" domain. Most dimensions showed a concentration of responses in scales 1 and 2, indicating low symptom frequency and intensity.

The "numbness" dimension showed greater variability in responses, with higher frequency in scales 3 and 4 than in the other dimensions, and it also had the highest proportion of responses in scale 4 (20.83%), indicating a more persistent presence of this symptom in part of the sample.

Overall, the findings indicate a low frequency and intensity of symptoms associated with scars. Regarding subjective perception (Table 2), 50% of the participants reported no discomfort related to the scar. In relation to the "Perception" domain of the scar (Figure 1c), variability was observed in perceptions of visibility and impact. Regarding hiding the scar, variability was greater: 41.7% reported not adopting this practice, 33.3% mentioned doing it occasionally, and 25% frequently or always. Overall, the results indicate that most participants perceive the scar as not very visible and with low behavioral impact. However, individual variability is evident, with some participants showing greater attention and awareness of its presence, although 62.5% report not feeling ashamed of the scar.

In the "Satisfaction with the appearance" domain (Figure 2a), a pattern similar to the "Appearance" domain emerged, with relatively higher scores, although overall perception was predominantly positive.

The highest frequencies of dissatisfaction were observed in scar length and texture, with 45.8% and 41.6% of participants, respectively. Overall, the results indicate greater satisfaction with scar redness, width, and brightness. In the overall assessment, 62.5% of participants reported being satisfied with the scar's appearance, while 37.5% expressed dissatisfaction.

In the "Satisfaction with symptoms" domain (Figure 2b), participants were predominantly satisfied. The numbness dimension showed a higher proportion of dissatisfaction (37.5%) and greater variability in responses, as did the strange sensations dimension (33.3% dissatisfaction), indicating that this aspect also negatively affects some participants.

Overall, the global assessment of satisfaction with the symptoms indicated a predominance of satisfaction, with 33.3% of the women very satisfied and 33.3% satisfied, while 20.8% reported dissatisfaction and 12.5% very dissatisfied (Table 2).

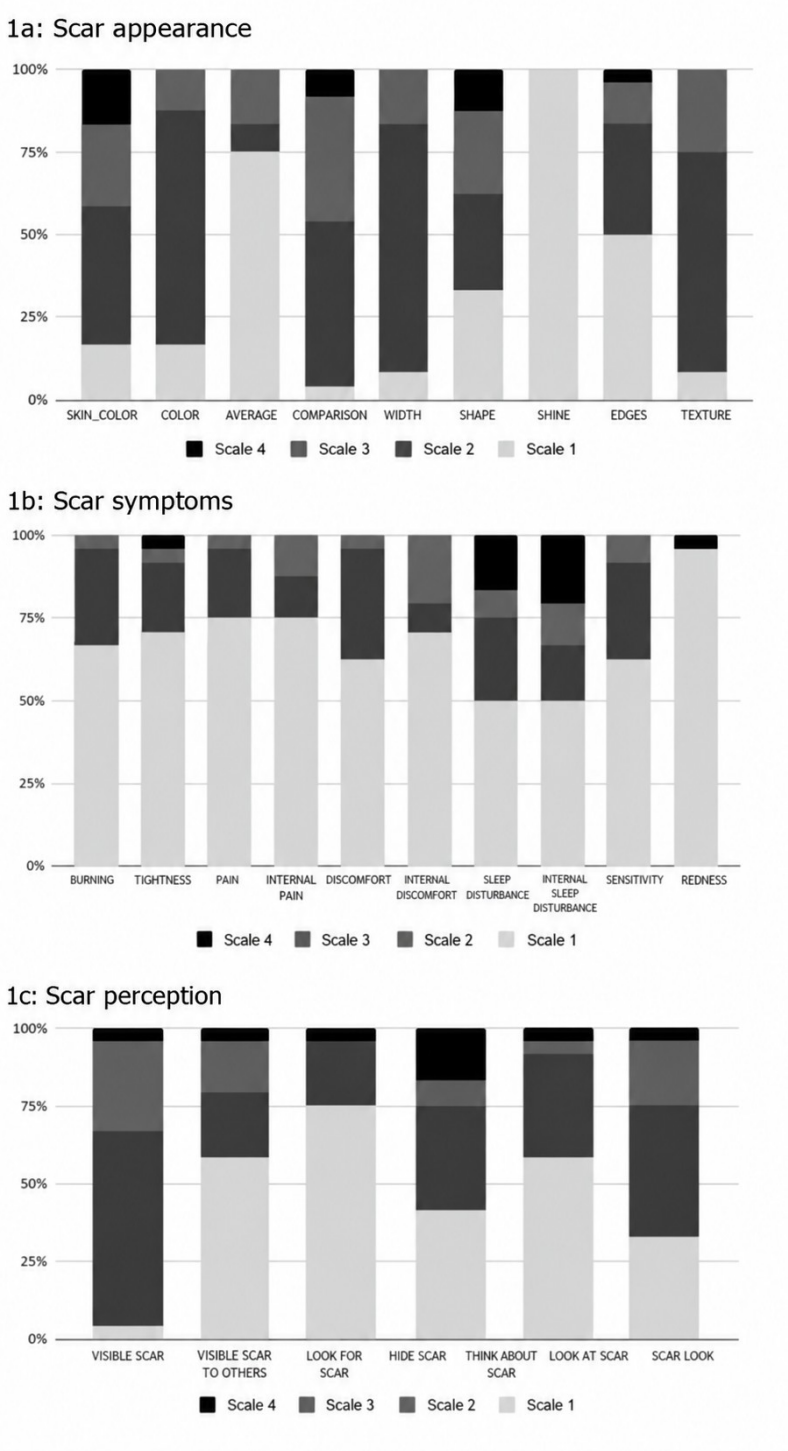


Figure 1. Relative frequency (%) of participants' responses attributed to each dimension integrating the domains of appearance, symptoms, and scar perception (N=24).

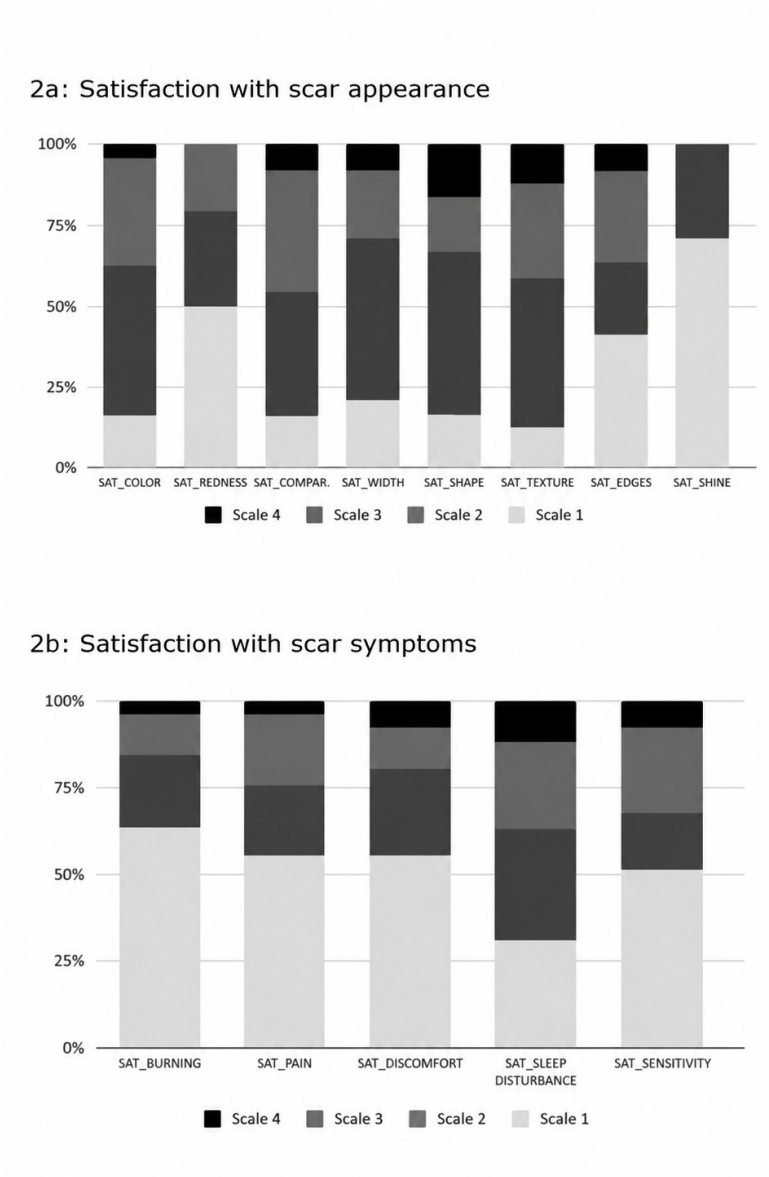


Figure 2. Relative frequency (%) of concepts in participants' responses attributed to each dimension integrating the domains of satisfaction with appearance and scar symptoms (N=24).

DISCUSSION

The present study aimed to describe the perception and satisfaction with the scar of women who underwent cesarean section through the PSAQ-BR. Overall, women reported a positive perception of the scar, with variations across domains, especially regarding appearance and symptoms.

The esthetic aspects, particularly color, length, width, and texture, were the main determinants of dissatisfaction. These findings align with the literature, which indicates that female body image is more vulnerable to esthetic changes, especially in sociocultural contexts that value physical appearance[20]. The length of the scar stood out as the aspect most frequently associated with dissatisfaction, possibly due to its increased visibility and impact on self-image[21].

Coloration also proved relevant, with some participants noticing a discrepancy compared to adjacent skin, which can intensify perceptions of esthetic imperfection and emotional discomfort[20, 21, 22]. On the other hand, aspects such as redness and shine received more positive evaluations, suggesting good scar evolution, as described in the literature[23,24]. Similarly, narrower scars were associated with better esthetic acceptance, while texture changes, such as hardening or irregularities, contributed to greater dissatisfaction[23, 9].

Dissatisfaction with appearance was associated with behaviors such as attempting to hide the scar, affecting self-image and self-esteem. This finding is consistent with studies that demonstrate that scars can be perceived as bodily imperfections, influencing self-acceptance, confidence, and even aspects of sexuality[21,20,25].

Regarding symptoms, most cases showed low frequency and intensity, corroborating previous findings indicating a predominance of mild symptoms in the late postoperative period[22]. Even so, participants reported symptoms such as numbness and strange sensations, which may reflect persistent sensory changes resulting from the scarring process[25].

In the "Perception" domain, most women considered the scar minimally visible and of low social impact, which may relate to the longer postoperative period in the sample, as described by Martins et al.[20] and Santos et al.[23]. However, the variability in scar-hiding behavior suggests that, in certain situations, visibility can still influence self-esteem[26].

Regarding overall satisfaction, although most participants reported being satisfied, a significant portion reported dissatisfaction, mainly related to esthetic aspects. These findings reinforce that, even with good functional recovery, subjective and cultural factors influence scar perception[21]. On the other hand, although symptoms had a smaller overall impact, numbness and uncomfortable sensations were relevant for some women, indicating that functional aspects should also be considered in clinical evaluation.

Thus, the results suggest that scar assessment should go beyond physical aspects and incorporate functional and psychosocial dimensions in postoperative care. Among the study's limitations, the small sample size and low representativeness stand out, which may limit the generalizability of the findings. Moreover, the profile of the

participants, predominantly women with higher education, married, and self-identified as white, may influence the reported perceptions[27]. The long average time since surgery may also affect the results, as perceptions of the scar tend to change over time. Moreover, self-reported measures can introduce biases related to emotional and cultural factors. Finally, the scarcity of studies on the psychosocial impact of cesarean scars limits broader comparisons.

CONCLUSION

The results show that the cesarean scar affects women's perception and satisfaction, with a particular emphasis on esthetic aspects, which proved to be the main determinants of this postpartum experience. Although the physical symptoms were generally low intensity, the scar's appearance played a central role in body perception and may have negatively influenced self-image.

Among the evaluated domains, scar appearance and satisfaction with its appearance were the most impactful, with symptoms showing less dissatisfaction. Color and size influenced esthetic perception more, while numbness was the most relevant symptom. Regarding perception, women paid more attention to their own scar than to others' perceptions, suggesting self-assessment had a greater influence.

These findings reinforce the importance of considering not only physical aspects but also esthetic and psychosocial factors in postoperative care. The clinical approach should treat scar appearance as part of the rehabilitation process, promoting body image acceptance and women's well-being. Our results encourage new studies exploring strategies for scar prevention and treatment, as well as more integrated and humanized approaches to postpartum care.

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