

Analysis on the Difference between the Practical Brassiere Size and Real Breast Volume

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Background: Brassiere cup size is defined as the difference in chest circumference between the inframammary fold and the fullest part of the breast. However, a large number of women are not aware of the correct definition and are prone to wearing incorrectly-sized brassieres. In this report, the authors compared the cup size of worn brassieres and the actual measurement.

Methods: This study was a retrospective review of patients who had undergone breast reconstruction operation between May 2020 and June 2021. All patients who visited the plastic surgery clinic for breast reconstruction were inquired about their cup size, and their breast circumferences were measured. The patient demographic information, ptosis grade, mastectomy specimen weight, measured breast circumference, and known cup size were analyzed.

Results: Overall, 163 women were included. Notably, 92 of 163 patients (56.4%) were wearing a correctly-sized brassiere. Patients were more likely to wear a correctly-sized brassiere as the cup size became smaller. Moreover, patients with A-cup breasts tended to wear larger brassieres, whereas patients with B and C-cup breasts tended to wear smaller brassieres than their actual breast cup size.

Conclusions: Approximately one in two women do not know their correct brassiere cup size. Women tend to wear a brassiere of the wrong size as their cup size becomes larger. Therefore, it is important for surgeons to be aware of their patient's brassiere wearing habit and their perception when a surgery, such as augmentation or reconstruction, is planned. (*Plast Reconstr Surg Glob Open* 2023; 11:e5141; doi: 10.1097/GOX.00000000000005141; Published online 14 August 2023.)

INTRODUCTION

Brassiere cup size is defined as the difference in chest circumference between the inframammary fold and the fullest part of the breast.¹ However, a large number of women are not aware of the correct definition and are prone to wearing an incorrectly-sized brassiere. Approximately 70%–80% of women wear incorrectly-sized brassieres, according to the media,^{2,3} and 100% of women indicated for reduction mammoplasty were observed to be wearing incorrectly-sized brassieres in a study carried out in the United Kingdom.⁴

Errors can occur during the breast surgery consultation process between patients and doctors. Patients often remember the cup size of the brassiere they wear

as their breast size, whereas doctors make surgical plans and determine the postsurgery breast size based on the actual measurements. This can lead to communication problems between patients and doctors; therefore, it is important to accurately understand and bridge the gap between the two.

However, there have been no studies regarding how women choose and how accurately they wear brassieres based on their breast size and chest circumference. In this report, the authors compared the brassiere cup size between the brassiere worn and the actual measurement in patients who underwent breast reconstruction.

PATIENTS AND METHODS

This study was a retrospective review of patients who underwent breast reconstruction operations between May 2020 and June 2021 at Asan Medical Center (Seoul, South Korea). All patients who visited the plastic surgery clinic for breast reconstruction were inquired regarding their cup size, and a board-certified plastic surgeon measured the patients' breast circumferences.

Disclosure statements are at the end of this article, following the correspondence information.

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Demographics

The patient demographic information [age, body mass index (BMI)], ptosis grade, mastectomy specimen weight, measured breast circumference, and self-reported cup size were gathered using eIUCectronic medical records. The primary outcome was to see whether patients were wearing a brassiere of the correct cup size.

Brassiere and Cup Size Definition

According to the standards of the Korean Industrial Standards Foundation for Clothing Sizes,⁵ the designation of a brassiere cup is determined by the difference between the bust circumference (BC) and under-bust circumference (UC), and the difference between cups is 2.5 cm (Fig.1). The cup size starts at AAA and continues alphabetically. This differs from the US/UK standards, which start with an A cup, representing a 2.54 cm (1-in.) difference between BC and UC and increases alphabetically as the difference increases by 1 inch. Table 1 shows the definition of each size, and correlation to the US/UK brassiere cup sizes.

Statistical Analysis

The chi-square test or Fisher exact test was used to compare the distribution of categorical variables, whereas the *t* test or Wilcoxon-rank sum test was used for continuous variables. Subgroup analyses were performed according to the cup size and ptosis grade. All tests of significance were two-sided; additionally, *P* values of less than 0.05 were considered

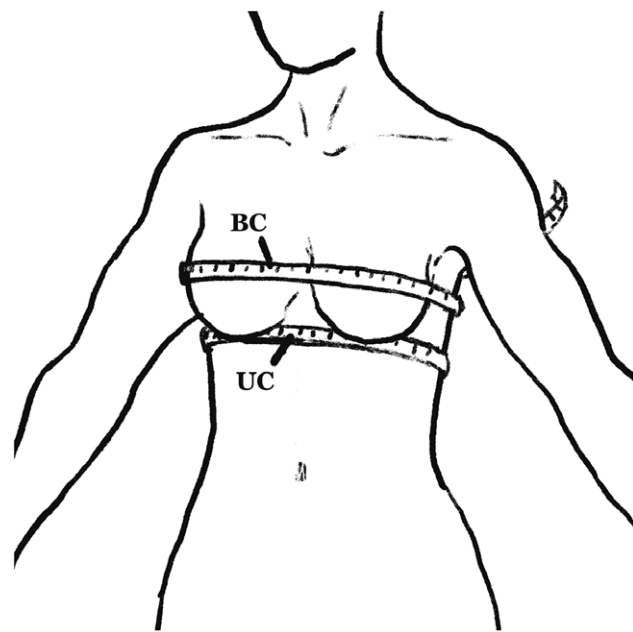


Fig. 1. Illustration of cup size measurement. The cup size is defined as the difference between the BC (chest circumference at the fullest part of the breast) and the UC (chest circumference at the inframammary fold).

Takeaways

Question: Many women are not aware of the correct definition of breast cup size; thus, we aimed to compare the brassiere cup size between the brassieres worn by patients and the actual measurements.

Findings: All patients visiting our clinic for breast reconstruction were inquired about their cup size, and their breast circumferences were measured. Only 56.4% of patients were wearing a correctly-sized brassiere.

Meaning: Approximately one in two women do not know their correct brassiere cup size; therefore, it will be important for surgeons to be aware of their patient’s brassiere wearing habit and their perception when a surgery, such as augmentation or reconstruction, is planned.

Table 1. Cup Size Definition

Cup Size	Meaning	Conversion to US/UK Size
AAA	Difference between BC and UC is 5.0 cm	B (2-in. difference) in US/UK size
AA	Difference between BC and UC is 7.5 cm	C (3-in. difference) in US/UK size
A	Difference between BC and UC is 10.0 cm	D (4-in. difference) in US/UK size
B	Difference between BC and UC is 12.5 cm	E (5-in. difference) in US/UK size
C	Difference between BC and UC is 15.0 cm	F (6-in. difference) in US/UK size
D	Difference between BC and UC is 17.5 cm	G (7-in. difference) in US/UK size
E	Difference between BC and UC is 20.0 cm	H (8-in. difference) in US/UK size

BC: chest circumference at the fullest part of the breast. UC: chest circumference at inframammary fold.

significant. The protocols of this study were approved by the institutional review board of Asan Medical Center (#2022-1686).

RESULTS

Of the 168 eligible patients, five refused to report their cup size. Therefore, the final analysis included a total of 163 patients. The patient demographics have been summarized in Table 2. The mean age of the patients was 44 (35–53) years, and all patients were women.

Notably, 92 of the 163 patients (56.4%) were wearing a correctly-sized brassiere. Conversely, 66 patients were wearing an incorrectly-sized brassiere, of which 34 wore an oversized and 32 wore an undersized brassiere. Furthermore, five patients did not know their brassiere size. Table 3 shows the univariable analysis of brassiere cup sizes in use. The ptosis grade, mastectomy weight, and measured cup size were all significantly different between the two groups.

Among the 92 patients who were wearing the correct cup size, 27 (29.3%) were wearing a correctly-sized brassiere, including cup size and circumference.

Table 2. Patient Demographics

Variable	
No. patients	163
Mean age (SD), y	44.39 (8.67)
Mean BMI (SD), kg/m ²	23.02 (2.89)
Measured cup size (%)	
	A 102 (62.6)
	B 26 (16.0)
	C 26 (16.0)
	D–E 9 (5.5)
Ptosis grade	
	0 103 (63.2)
	1 32 (19.6)
	2 21 (12.9)
	3 6 (3.7)
Mastectomy specimen weight (SD), kg	362 (240)

Table 3. Univariable Analysis of Brassiere Cup Size in Use

Variable	Correct (n = 92)	Incorrect (n = 66)	P
Age [mean (SD)]	43.98 (8.16)	44.95 (8.99)	0.479
BMI [mean (SD)]	22.25 (2.84)	23.85 (2.61)	<0.001
Ptosis grade (%)			0.001
	0 69 (75.8)	31 (47.0)	
	1 11 (12.1)	21 (31.8)	
	2 9 (9.9)	10 (15.2)	
	3 2 (2.2)	4 (6.1)	
Mastectomy weight (median [IQR])	290 [188–370]	361 [294–502]	<0.001
Measured cup size (%)			<0.001
	A 72 (79.1)	27 (40.9)	
	B 13 (14.3)	13 (19.7)	
	C 4 (4.4)	19 (28.8)	
	D–E 2 (2.2)	7 (10.6)	

For categorical variables, a chi-square test or Fisher exact test was used, and the n (%) was reported.

For continuous variables, a *t* test or Wilcoxon-rank sum test was used, and the mean (SD) or median [IQR] was reported.

IQR, interquartile range.

A subgroup analysis of the ptosis grade, measured cup size, and brassiere circumference in use is depicted in Table 4.

DISCUSSION

This study was the first to accurately measure breast size and compare it with the actual size of brassieres worn in the South Korean population. Only 56.4% of patients were wearing a brassiere with the correct cup size, and 25.8% of patients were wearing brassieres with correct cup size and circumference. Compared with patients wearing brassieres with the correct cup size, those wearing a brassiere with an incorrect cup size tended to have higher BMI, more ptotic breasts, and larger breasts according to the mastectomy weight and measured cup size. A subgroup analysis according to the cup size showed that patients were more likely to wear a correctly-sized brassiere as the cup size decreased. Moreover, patients with A-cup breasts tended to wear larger brassieres, whereas patients with B- and C-cup breasts tended to wear brassieres smaller than their actual cup size. For breast circumference, patients tended to wear brassieres with a circumference larger than their actual size, while 39.3% of patients did not know their breast circumference. There have been reports regarding correlation between breast mastectomy weight with preoperative cup size,⁶ which showed a weak correlation. Although we included mastectomy weight as a variable, we did not find a significant correlation between cup size and mastectomy weight. It is possible that this lack of significant correlation can be attributed to the fact that nine different breast surgeons performed the mastectomies in our study, and that they all have varying degrees of expertise, and the extent of breast resection varies among them. There is a particularly significant variation in the lateral and upper border of the breast, and as the size of the breast increases and the border of the breast extends beyond the anterior axillary line, the deviation becomes even greater.

Table 4. Subgroup Analysis of Patients Wearing the Correct Cup Size

		Overall (n = 163)	Correct (n = 92)	Smaller (n = 32)	Larger (n = 34)	Unknown (n = 5)
Age [mean (SD)]		44.39 (8.67)	43.86 (8.19)	42.94 (8.42)	46.85 (9.21)	46.60 (13.52)
BMI [mean (SD)]		23.02 (2.89)	22.26 (2.82)	23.99 (2.78)	23.72 (2.47)	26.00 (3.31)
Ptosis grade (%)		104 (63.8)	70 (76.1)	13 (40.6)	18 (52.9)	3 (60.0)
	0	32 (19.6)	11 (12.0)	10 (31.2)	11 (32.4)	0 (0.0)
	1	21 (12.9)	9 (9.8)	6 (18.8)	4 (11.8)	2 (40.0)
	2	6 (3.7)	2 (2.2)	3 (9.4)	1 (2.9)	0 (0.0)
Mastectomy weight [mean (SD)]		362.08 (239.53)	319.99 (278.23)	443.34 (190.08)	379.94 (128.10)	495.00 (169.66)
Measured cup size (%)		102 (62.6)	73 (79.3)	0 (0.0)	27 (79.4)	2 (40.0)
	A	26 (16.0)	13 (14.1)	7 (21.9)	6 (17.6)	0 (0.0)
	B	26 (16.0)	4 (4.3)	18 (56.2)	1 (2.9)	3 (60.0)
	C	9 (5.5)	2 (2.2)	7 (21.8)	0 (0.0)	0 (0.0)
	D–E	42 (25.8)	27 (29.3)	9 (28.1)	6 (17.6)	0 (0.0)
Wearing bra circumference (%)	Correct	14 (8.6)	7 (7.6)	3 (9.4)	4 (11.8)	0 (0.0)
	Smaller	43 (26.4)	25 (27.2)	9 (28.1)	9 (26.5)	0 (0.0)
	Larger	64 (39.3)	33 (35.9)	11 (34.4)	15 (44.1)	5 (100.0)
	Unknown					

We excluded these data because they are irrelevant to the actual pattern of bra wearing and may lead to confusion. Additionally, differences in the type of mastectomy performed (nipple-sparing versus skin-sparing) may have also played a role.

There may be various reasons for this discrepancy. First, there is a lack of consistency among brassiere manufacturers with respect to the band length and cup volume.^{7,8} This hinders women's ability to choose an appropriate brassiere. Additionally, women exhibited a poor ability to choose an appropriately-fitted brassiere even when allowed to try on several sizes.⁹ A study performed in South Korean young women showed that participants often wore brassieres purchased by their mothers without previously fitting them,¹⁰ and tended to focus on the beauty of the brassiere, rather than on accurate sizing.¹¹ Ill-fitting brassieres can lead to musculoskeletal problems in these women.¹² Thus, it is important for surgeons to know the patients' brassiere wearing habits and their perception when a surgery, such as augmentation or reconstruction, is planned.

During breast surgery consultations, patients communicate their desired breast size through the use of cup sizes, which may lead to discrepancies between the patient's expectations and the surgeon's interpretation. Therefore, it is important to ensure clear communication between the patient and surgeon during the presurgical consultation to minimize the potential for miscommunication and errors. On average, when the breast volume increases by approximately 100 mL, the cup size will increase by one.¹³ However, it should be noted that this can vary depending on the individual's breast and chest measurements.^{7,14} In a study in 2017, 130–150 mL equates to a one-cup-size increase in Australian women.¹⁵ However, in the Asian population, 100 mL remains more widely accepted as a one-cup-size increase. Notably, if a patient is wearing an undersized brassiere, they may perceive their new size as a cup size smaller than it is. For example, a woman with B-cup breasts wearing an A-cup brassiere will perceive her B-cup breasts as A-cup. If she wants an augmentation to a C-cup, this means two cup sizes up from A-cup to C-cup. However, a plastic surgeon will most likely decide based on actual measurements, know her breasts as B-cup, and perform only one cup size up to a C-cup. Due to the patient's misconception of perceiving B-cup breasts as A-cup, she will also perceive augmented C-cup as B-cup. This will lead to dissatisfaction, and vice versa if the patient is wearing an oversized brassiere. Therefore, it is crucial to determine the patient's accurate cup size before surgery by checking if they are wearing the correct size of brassiere.

Limitations

There have been several studies on the association between brassiere cup size and incidence of breast cancer. Previous studies have shown no association between brassiere cup size and the risk of breast cancer.^{16–18} However, in a recent large prospective cohort, Kusano et al¹⁹ reported that in leaner women, a larger brassiere cup size was associated with a higher incidence of premenopausal breast cancer. Therefore, further research on the

general population may be appropriate to elucidate this matter.

CONCLUSIONS

Approximately one in every two women do not know the correct cup size of their brassiere. People tend to wear incorrectly-sized brassieres as their cup size becomes larger. Therefore, it is important for surgeons to be aware of their patients' brassiere-wearing habits and their perception when a surgery, such as augmentation or reconstruction, is planned.

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DISCLOSURE

The authors have no financial interest to declare in relation to the content of this article.

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