

Development of Design Criteria for Mastectomy Bra: Human-Centered Design (Part I)

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According to a survey by the American Cancer Society (2017), there are 3.5 million women who are living with a history of breast cancer in the United States. Most mastectomy patients were concerned with how they look and feel after the surgery (Avis, Crawford, & Manuel, 2005). Many designers and researchers have focused on functional clothing for specific user situations; this has been highlighted as important in the development of functional design considerations (Lamb & Kallal, 1992). Regarding the design of a mastectomy bra, the restoration of body image is a vital aspect in adjusting to substantial physical, emotional, psychological changes following diagnosis and treatment (LaBat, Ryan, & Sanden-Will, 2016). Thus, it is significant to investigate the problems current mastectomy bras have for their users and to understand what main considerations can improve bra designs. This study elucidates the core needs of mastectomy patients and indicates the key elements of design for the development of bras for women who have had a mastectomy.

In this study, a focus group interview was conducted to understand real-life conditions and compare them with current knowledge to identify the root-cause of problems with mastectomy bras through open-ended questions. Eight participants were recruited from a mid-western urban area including both bilateral (loss of both breasts) and unilateral (loss of one breast) cases. The FEA (functional, expressive, and aesthetic) consumer needs model (Lamb & Kallal, 1992) was used to identify design criteria for mastectomy bra design by considering human-centered concerns (physical, psychology, and ergonomic). Based on the results of the focus group interview and the literature review, eight design criteria were identified: ‘line/shape’, ‘sexuality’, ‘fit/movement’, ‘thermal comfort’, ‘stylish/attractive’, ‘pressure/pain’, ‘design details’, and ‘self-esteem’.

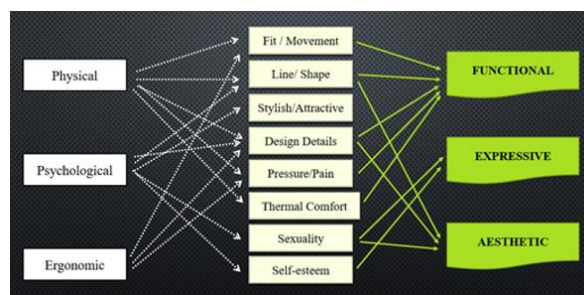


Figure 1. Analysis of design criteria

The three functional design categories (Gupta, 2011), physical, psychological, and ergonomic, were initially used to identify the eight design criteria. These were then mapped to the FEA model (Lamb & Kallal, 1992). There were clear connections among the requirements of a mastectomy bra, and these main themes, functional, expressive, and aesthetic, had a powerful effect on evaluating eight design criteria (Figure 1). Using a human-centered design perspective, a mastectomy bra should address physical matters, such

as comfort, fit, and symmetrical shape. Also, psychological considerations, such as feelings of attractiveness, sexuality, and self-esteem were most significant to users in achieving quality of life. To better understand the users of mastectomy bras, it is necessary to depict the duality of the functional yet fashionable bra, and at the same time designing to achieve harmony between physical and psychological comfort.

Table 1. Identifying Design Details and Concern Factors

Main Theme	Design Criteria	Material			Color		Print		Neckline			Closure		Strap			Wire		Under-band		Side-band		Cup			
		Natural Fabric	Stretching fabric	Thick fabric	Thin fabric	Monotony	Colorful	Monotony	Prints (Flower/ Pattern)	High	Low	Tight	Loose	Front	Back	Zipper	Hook-Eye	Wide	Thin	No-wire	Molding	Wide	Thin	Wide	Thin	Padding
Functional	Fit/ Movement		o						o		o					o	o			o						o
	Line/Shape		o		o						o								o					o		o
	Thermal Comfort	o			o																o				o	o
	Pressure/Pain		o	o								o		o					o	o						
Aesthetic	Design Details					o		o	o		o	o	o	o	o	o			o	o	o	o	o	o	o	o
	Stylish/ Attractive					o		o											o						o	
Expressive	Sexuality					o		o		o									o						o	
	Self-esteem					o		o	o	o	o								o	o			o		o	
Final Finding		√		√		√		√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√

User focus group interviews gave a better understanding of what individuals truly wanted and needed from the products available on the market. The result highlights the differences between what previous research states as best for the users and what the users would actually prefer. As a result of the discussions, we were able to pinpoint themes that helped to solidify design criteria that takes into account as much of the information provided as possible. This study explored optimized design criteria for mastectomy bras based on both theoretical underpinnings using the FEA model and the Gupta’s three requirements of functional clothing and participatory perspectives through user interviews. Thus, resulted criteria would be more reliable and user-centered for future mastectomy bra design.

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