

Effects of Side Strap and Elastic Hems of Bra Materials on Clothing Pressure Comfort

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Abstract

The pressure comfort is one of the most important criteria in evaluating the comfort degree of clothing. This study seeks to present the effect of the pressure distribution by different fabrics on the side strap and elastic hems of bra. Five commercial bras of size 75A have been tested on three healthy females. The pressure values have been measured using an AMI-3037-5S Air-pack pressure measuring system. The results indicate that the clothing pressure values were affected by the materials' tensile resistance, the radius of body curvature and breath. The lower the tensile resistance of side strap material, the smaller the clothing pressure. The clothing pressure values were bigger where the radius of body curvature is smaller. The pressure values on the side strap and elastic hems of bra were changed with natural breathing, and the range of pressure values would be expanded when taking a deep breath or after exercise.

Keywords: Clothing Pressure; Material; Side Strap; Bra; Pressure Comfort

1 Introduction

As a kind of female underwear, bra has become necessary in women's daily life. The characteristics of bra include its cup shape being skin-tight with the breasts, its pattern making and production techniques as complicated, and usage of many materials. All of these characteristics bring on many problems of wearing bras and its research value is the highest in daily clothes. The main functions of wearing bras are remedial shaping curves of female's breasts to support breast protect breast and also to avoid pull in sports [1].

Currently, there are many classifications according to its characteristics, functions and structures. There are varied bras in the markets now, such as common bras, sports bras, breastfeeding bras, sleeping bras, seamless bras, nursing bras, and so on [2, 3]. According to the pressure in

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wearing bra, it can be classified as high pressure bra, moderate pressure bra and low pressure bra. Representative high pressure bra is push-up type bra that has under wires in order to enhance the effect of breast shape. When women wear the high pressure bra, their breasts would be forced to distortion, and then high pressure comes in between breasts and bra. Typical moderate pressure bra is sports bra that is a kind of bra without under wires. This kind of the bra will both protect the breast not to be pulled and can not prevent breathe against the oppression in sport. Generally, low pressure bra has certain specific functions. Its representative is breastfeeding bra and sleeping bra. The breast can't bear high pressure in lactation and sleeping or else it would cause the inflammation of the breasts, so this kind of bra does not contain under wires too. The main roles of low pressure bra are supporting the breasts and preventing breasts from sagging down.

In material aspects, the main material of high pressure bra is elastic material, and its representative is the mixed elastic materials of polyamide and polycarbamate; moderate pressure material generally adopts mixed fabric, such as 90%~95% cotton and 5%~10% elastic fabric; low pressure bra's material is mainly pure cotton fabrics, maybe with less mixed material of cotton and with elastic fabric used in the flank. The supporting effect of cup is realized by the pattern making of bra. This article mainly researches on high pressure bra that brings higher pressure in women's body.

High pressure bra would cause many negative consequences including muscle strain, bones distortion and the internal organs displacement. The higher the pressure is, the greater the damage to women's body [4].

From the 16th to the 19th century, many European noble ladies wore over high pressure bra to pursue a bodily form of plump breasts, slender waist and huge stern, causing the body to be badly hurt with untimely or sudden deaths. Although there are many improvements of current bra than before, the problems of wearing bra still exist in choosing wrong bra sizes, wearing bras in wrong ways and wearing them for prolonged period of time and so on. All these will lead to breasts' diseases, such as breast hyperplasia, breast initiatives swollen, breasts spilled liquid, and even breast cancer.

The bra's pressure has gradually been researched by many scholars from different countries, but it still lacks any study on the effects of high pressure bras by elastic fabric. This article has studied the effect of elastic fabric to pressure, tested the fabric elasticity of different bras, and analyzed the values of different bra's elastic fabrics.

Several studies have been researched on clothing pressure of push-up bra [5, 6]. However, there are few papers about the clothing pressure distribution and comfort of pressure at bra's side straps. In this study, the pressure values were measured by using AMI-3037-5S Air-pack type contact surface pressure measuring system. It might be important for manufacturers to produce more comfortable bras and for women to select more fit bras.

2 Problem Formulation

2.1 Participants

The participants were 3 healthy female students in 23 to 25 years old. Every one of them worn five 75A size bras respectively. The numbers of three participants were S1, S2 and S3 respectively. From each participant, basic personal data, such as stature, weight, bust, under bust, BMI and