

STRONG CHILDREN'S RESEARCH CENTER

Summer Research Scholar

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ABSTRACT

Title: *Development of a Sports Bra Analysis Criteria*

Background: Sports bras are an essential for women looking to participate in physical activities. When performing athletic activities without sports bras or with sports bras that lack support, breast and back pain can occur due to breast displacement. Breast pain impacts up to 60% of women at rest and increases when women are active. For women with larger breasts, this need for sports bras is even more paramount, as they are more likely to experience this pain due to the increase in breast motion during activity.

Objective: To determine what components of sport bra design are most prevalent in the sports bra market and to develop a standardized approach to measure sports bra components that may relate to biomechanical forces that could be utilized in further studies.

Methods: The target population included adolescent female athletes from ages 14-18 years old recruited from local sports teams/clubs. Images of the participants from both the posterior and anterior view were obtained as part of an ongoing kinematics study. In this initial study, participants came for multiple visits and were photographed each time in a sports bra of their own choosing. Based on a literature review of articles related to sports bras and breast kinematics, a criterion was developed to analyze the images that consisted of four overall categories: Measurements, Ratios, Sports Bra Components and Fit, and measurement subgroups under each category. Measurements of the images were taken using the Adobe Acrobat Pro software and compiled in a database.

Results: 35 participants were photographed, and 67 images were measured after excluding sports bras worn multiple times by the same participant. Participants were 46.3% A cups, 24.1% B cups, 16.7% C cups and 13% D cups. Three analyses were performed as a part of a preliminary analysis which included differences in measurements by cup size (A vs. above A), cup size (A vs. B vs. C vs. D) and strap orientation (racerback vs. other). For the A cup vs. above A analysis, the only difference found was the ratio of strap width at the clavicle to the axilla width (frontal) ($p=.025$). Analysis across all cup sizes found the only difference to be in the jugular notch to top of sports bra measurement ($p=.004$). The athletes with C cups were found to differ in jugular notch to top of sports bra measurement compared to athletes with A, B, and D cups. Analysis by strap orientation found differences in vertical measure ($p=.016$), vertical measure compared to jugular notch to ASIS ($p=.014$) and number of straps ($p<.001$).

Conclusion: We had initially expected greater differences when comparing smaller and larger chest sizes, as some sports bra features may provide additional support, therefore a more in-depth analysis will be conducted to look for additional trends in the data.

