

Men's purchase behavior and fit preferences for compression sportswear for fitness

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Introduction and Objective: Compression wear is originated from medical treatment to cure venous diseases by using compressive stocking (Melo, Tojal, Leal, & Couto, 2015). In sports, they were found to improve athletic ability by decreasing muscle vibration and by recovering fatigue rapidly, which prevents injury during exercise (Kim, Kim, & Choi, 2016; Koo, 2011). Wearing compression pants were also found to enhance the sprinting performance by increasing the vertical jump height via reducing oscillation of thigh muscle in landing from jump (Doan et al., 2003). Also, after intensive muscle exercise with compressive wear, the power of dynamic extension at hip and legs could be significantly increased (Hettchen et al., 2019). Compression garments have been used in sports since 1996 when Kevin A. Plank, the founder of Under Armour, developed a product called 'second skin' adhering closely to the skin, and received a lot of public attention in London Olympics held in 2012 (Lee, 2012; Moon, 2013).

Today, compression wear is widely available and expected to grow approximately 5.3% from 2019 to 2024, and hence reach to US\$5,520 million by 2024 in the worldwide sales (360 Market Updates, 2019). In the global compression sportswear market, there are many emerging players in addition to the major companies such as Nike Inc., ADIDAS AG, and Under Armour Inc. (Chaturvedi, 2016; 360 Market Updates, 2019). Specifically, the overall sales growth of men's sportswear surpassed women's in the U.S. by 2% in 2019 (The NPD Group, 2020). Related to this, the sales of men's compression sportswear for fitness have also soared due to the benefit of muscle recuperation during and after fitness (Bell, 2018; The NPD Group, 2020). With this trend, a lot of compression sportswear products have been released in the fashion market, and accordingly, consumers became confused about which product fits their preferences better among numerous sportswear brands (Emery & Howard, 2020). Keeping up with the current consumer needs, **the primary purpose of this present study** was to identify preferred sportswear brands based on user experiences; relationships among body types, particular body locations for intensive compression and fit satisfaction levels; exercising routines and sportswear sizes were examined to provide basic information for designing effective compression sportswear.

Methods: The questionnaire was created in Qualtrics and distributed online through Amazon Mechanical Turk upon receiving an IRB approval. The targeted population was men aged 18-35 who regularly wore compression sportswear for fitness. Participants were recruited from the U.S. The questionnaire was comprised of 11 close- and open- ended questions about age, stature, weight, physique type, sportswear size, fitness routine, preferred sportswear brands, compression fit, and measurement fit. Adult Body Mass Index (BMI) was calculated using stature and weight based on the following criteria from Centers for Disease Control and Prevention. BMI values (a) less than 18.5 fell within the underweight range, (b) from 18.5 to <25, fell within the normal, (c)

from 25.0 to <30 fell within the overweight range, and (d) 30.0 or higher fell within the obese range (Centers for Disease Control and Prevention, 2020). A 3-point Likert-type scale anchored from 1(shorter) to 3(longer) was used for measuring the perceived length of the compression garments in comparison to participants' body measurements for top, bottom, arm, and pelvis. The comparative fit results were then clustered into two groups (i.e. satisfactory and unsatisfactory) for further analyses to examine relationships between body types based on BMI and sportswear size. Statistical Package for Social Science (SPSS) 25 was used to analyze data using descriptive statistics and One-Way ANOVA with Duncan Post Hoc multiple comparisons. **Results:** A total of 180 respondents participated in the survey and 120 of the responses were found to be useable for statistical analysis. The stature of 50 percentiles was 5 feet 8 inches while the weight of 50 percentiles was 170 pounds. 100 respondents out of 120 indicated their body types as muscular. BMIs were predominantly within the normal (48.3%), overweight (26.7%), or obese (20.8%) ranges; whereas only a few BMIs were within the underweight range (4.2%). More than half of the participants (54.2%) were found to be exercising three times a week. Most of the participants (70.8%) wore either size medium (M) or large (L). Specifically, for tops, 43.3% of the participants wore size L and 27.5% wore size M. For bottoms, 32.5% of the participants wore size M and 31.7 % wore size L. The specific body locations where intensive pressure was needed for effective fitness were found to be chest (57.5%), shoulder (49.2%), abdomen (49.2%), waist (39.2%), back (39.2%), knee (38.3%), bicep (30.8%), hip (29.2%), elbow (21.7%), and calf (20.0%).

As for the comparative fit assessments, 75.0-79.2% of the participants were satisfied whereas only 20.8-25.0% of the participants were dissatisfied with the all four lengths. The second group perceived garments to be longer (16.7-19.2%) or shorter (4.2-6.7%) in comparison to their body measurements. Findings for the second group indicated that underweight range (0-0.8%) was wearing size XS or S, normal range (9.2-12.5%) was wearing M or L, overweight range (5.0-9.2%) was wearing L or XL, and obese range (2.5-6.7%) as wearing L or XXL. When all of the participants were considered, there were significant differences among sportswear sizes depending on body types at $p < .05$ for top (F -value: 3.95) and at $p < .01$ for bottom (F -value: 5.31). However, there were no significant differences about fit evaluations among body types (F -value: 0.11-1.56, $p > 0.20$); and about preferred locations for compression among body types (F -value: 0.18, p : 0.91).

More than half of the participants (54.2%) had one to two pieces of compression sportswear for top and 56.7% participants had one to two pieces for bottom. Only 33% participants had three to four pieces of compression sportswear for top and bottom each. More than half of the participants (56%) indicated Nike as their preferred brand while Adidas was ranked in second (55.8%), Under Armour was ranked in third (33.3%), and Puma was ranked in fourth (28.3%). The rest of sportswear brands (e.g., Champion, New Balance, Columbia Sportswear, Umbro, Asics, Lululemon, HEAD, and LECAF) indicated low percentages that varied from 2.5-12.5%. The important reasons why customers preferred these sportswear brands for compression sportswear for fitness were listed as desirable fit (56.7%), favorable design and color (49.2%), satisfactory quality in durability (45.8%), suitable pressure feeling (42.5%), affordable price

(37.5%), easy to wash (33.3%), high brand value (31.7%), trendy products (25.0%), and satisfactory fabric functions (16.7%).

Conclusions and Implications: Almost half of the participants, who were wearing compression sportswear for fitness, had muscular body types and were within the normal BMI range, and the other half was in either overweight or obese BMI ranges. Several sportswear brands such as Champion, New Balance, and Asics were found to be in need of enhancing their compression wear in regards to fit, design, and pressure comfort. The primary body locations (i.e., chest, shoulder, abdomen, waist, back, and knee) were found to be important for providing intensive compression for fitness, therefore should be considered when improving compression sportswear design for fitness. No significant differences among the BMI ranges based on fit evaluations from four areas (top, bottom, arm and pelvis), and compression preferences were found. Therefore, future studies should focus on horizontal body dimensions and evaluate specific measurements (e.g., girths and widths) in correlation to the BMI ranges.

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