Adaptive Apparel: A Systematic Review

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Introduction and Purpose. The adaptive apparel sector has been increasingly growing within the apparel retail industry in recent years. Some mainstream retailers have become more aware of the apparel needs of people with disabilities (PWDs), and other brands have exclusively focused on developing adaptive apparel. PWDs make up about 13% of the US population with $21 billion in disposable income, and this market is continually growing and was expected to reach about $54.8 billion in 2023 (McBee-Black & Ha-Brookshire, 2020). The adaptive apparel industry gained traction in 2016 when Tommy Hilfiger partnered with adaptive apparel advocate, Mindy Scheier, to launch the first mainstream adaptive apparel line (Mc-Bee-Black, 2022). Before this partnership, the apparel industry often overlooked and ignored PWDs. Since then, other mainstream retailers such as Target, Kohl's, Nike, Zappos, etc. have developed adaptive apparel lines. Challenges that PWDs encounter when shopping for apparel include finding apparel that meets functional, expressive, and aesthetic needs (Li et al., 2023).

Many published studies have focused on adaptive apparel in terms of market size, evaluating the apparel needs of PWDs, and the impact of adaptive apparel. However, no systematic review has been published on the subject of adaptive apparel. Thus, this study aims to include a comprehensive review of the literature to determine the current state of the literature on adaptive apparel. This paper reviews published journal articles that focus on adaptive apparel as well as the market and needs for PWDs. Such a systematic review helps apparel scholars build a foundation of research domains and identify knowledge gaps through knowledge assimilation (Su et al., 2022).

Methodology. The seven-step methodology by Sharma et al. (2020) was adopted in this study. This includes (1) defining the research objectives, (2) deciding the search keywords, (3) inclusion and exclusion criteria, (4) retrieving articles from the search engines/databases, (5) obtaining final search results after the in-depth screening, (6) conducting analysis of the articles, and (7) identifying future research agenda. Figure 1 illustrates this process step-by-step for identifying and collecting the literature for this review. This study collected published studies between 1985-2023. Following the in-depth selection process and inclusion and exclusion of certain criteria (Figure 1), a total of 56 journal articles were relevant to adaptive apparel and understanding the market and apparel needs for PWDs and were selected for this review.

Results and Discussion. In this study, content analysis and frequency distributions were performed to determine the year, author information (name, country, discipline, and university), journal name, category, research method, theory, and major data analysis method for each

journal article. Of the 56 journal articles reviewed, seven were published in 2022, making this the top year, followed by five each published in 2020, 2021, and 2023. In terms of *decades*, four journal articles were published between 1980-1989 (7.1%), seven between 1990-1999 (12.5%), 10 between 2000-2009 (17.9%), 13 between 2010-2019 (23.3%), and 22 between years 2020-2023 (39.3%) showing a large increase during this period. The *top authors* out of the journal articles reviewed were Kerri McBee-Black with 8.9% (n=5), Alida Esmail with 5.4% (n=3), Allison Kabel with 5.4% (n=3), Jane M. Lamb with 3.6% (n=2), and Qilong Feng with 3.6% (n=2). This review identified 11 countries in total from which the authors resided. The *top countries* identified were the USA with the highest frequency of n=38 or 67.9%, then followed by the UK (n=4 or 7.1%), Canada (n=3 or 5.4%), India (n=3 or 5.4%), and China (n=3 or 5.4%). Three major categories of the authors' *disciplines* were identified as, Textile, Apparel, and Retail (n=26 or 46.4%) with the most frequency, followed by Health Sciences, Health and Social Services, Physical Therapy, Medicine (n=9 or 16.1%), and Consumer Affairs/Consumer Studies (n=4 or 7.1%), with other disciplines accounting for 30.4% (n=17). The *top five universities* that published the most journal articles relating to adaptive apparel were the University of Missouri (n=8 or 14.3%) publishing the most, followed by the University of Delaware (n=4 or 7.1%), Université de Montréal (n=3 or 5.4%), and the University of Georgia and Hong Kong Polytechnic University both accounting for two each (3.6% each).

The *top journals* that most of the articles reviewed were published in were *Clothing and Textiles Research Journal* (n=14 or 25%), followed by the *International Journal of Fashion Design, Technology and Education* (n=4 or 7.1%), *Journal of Fashion Marketing and Management*, *Fashion Practice*, and *Applied Ergonomics* each accounting for three each (5.4% each), and *Perpetual and Motor Skills* and *Family & Consumer Sciences Research Journal* both accounting for two each (3.6% each). The *top categories* that the journal articles fell under included Design/Product Development as the top category (n=24 or 42.9%), then followed by Social/Psychological Aspect (n=13 or 23.3%), and Consumer Behavior (n=10 or 17.9). The three *top theories* that were most frequently used in the journal articles reviewed were the Function, Expressive, and Aesthetic Consumer Needs Model (n=8 or 14.3%) (e.g., Li et al., 2023), the Inclusive Design Framework (n=3 or 5.4%) (e.g., Carroll & Kincade, 2007), and the User-Oriented Design (n=4 or 7.1%) (e.g., Cho et al., 2020). Twenty-two articles were found to have no theory (39.3%). The most frequently used *research method* was Qualitative (Interview/Case Study) (n=19 or 33.9%) (e.g., McBee-Black & Ha-Brookshire, 2022), and the next most used was Quantitative (n=16 or 28.6%) (e.g., Carroll & Gross, 2010), then Literature Review (n=10 or 17.9%) (e.g., Feng & Hui, 2021), Conceptual Paper (n=8 or 14.3%) (e.g., Lamb & Kallal, 1992), and Mixed Method (n=2 or 3.6%) (e.g., Hudson & Hwang, 2022). Regarding the *major data analysis methods*, Qualitative-Thematic Analysis was used most frequently (n=15 or 28.6%), followed by Quantitative-Descriptive Analysis (n=11 or 19.6%), then Quantitative-ANOVA/Factor Analysis/Regression/SEM (n=9 or 16.1%), and Content Analysis (n=6 or 10.7%).

Conclusions and Implications. The findings from this study indicate existing research gaps and provide directions for future research. Based on the findings, we propose that future studies

consider more merchandising related topics, mix-methods research approach, large scale quantitative survey of PWDs, and research from emerging countries worldwide.

Figure 1. The literature identification and screening process
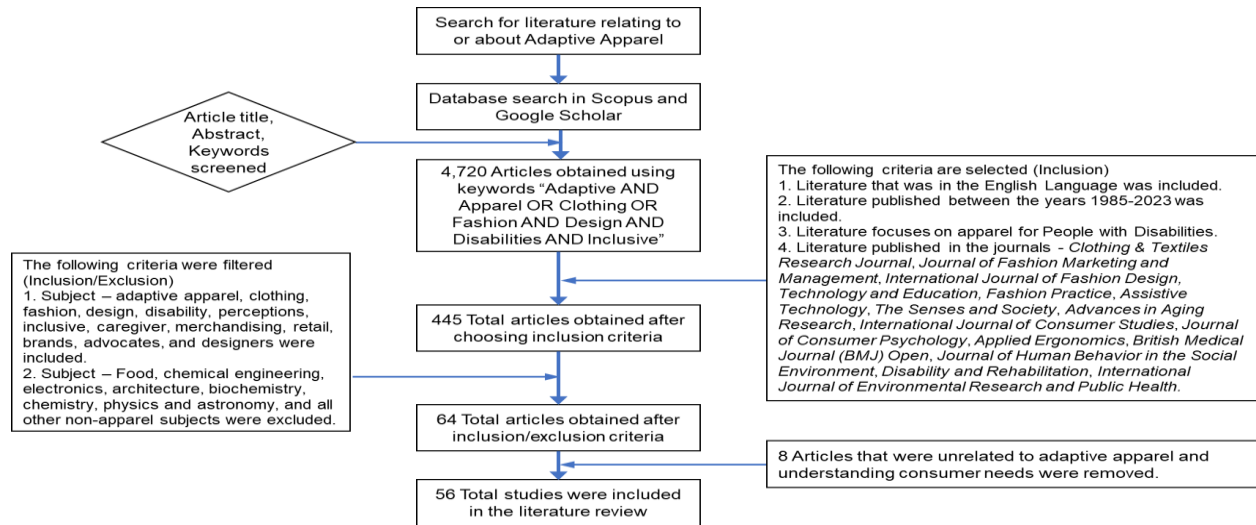
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