



## Exploring the Functional, Expressive, and Aesthetic Needs of Generation Z Wheelchair Users to Inform the Design of a Functional Outdoor Jacket

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**Introduction.** Generation Z is currently the world's largest and most diverse generation (Parker & Igielnik, 2020). For Generation Z wheelchair users (GZWU), finding clothing that accommodates their needs and requirements can be a challenge (McBee-Black, 2021), particularly when it comes to outdoor wear. Outdoor activities are essential for GZWU's physical and mental well-being (Kim & James, 2019), but without functional clothing, it may be difficult to participate fully in outdoor activities. While there has been a growing interest in adaptive clothing for people with disabilities (PWDs), there is still a gap in the market for fashionable and functional outdoor clothing designed for GZWU. Therefore, this study aimed to explore the functional, expressive, and aesthetic design needs of GZWU when wearing and using a functional outdoor jacket. To answer the study objective, the following research questions were explored. **RQ1:** What are the specific requirements for an outdoor jacket for GZWU, and how can these requirements meet the needs of GZWUs and **RQ2:** What difficulties and challenges does GZWU face in an outdoor jacket?

**Design Theory.** The FEA Consumer Needs Model (FEA Model) proposes that products need to fulfill functional, expressive, and aesthetic factors to satisfy consumers and succeed in the market (Lamb & Kallal, 1992). The researchers used the FEA Model as the framework for this study to identify the specific needs and requirements of GZWU, such as the need for comfort, accessibility, mobility, and production (Orzada & Kallal, 2021). Using the FEA Model will ensure the needs and requirements of the GZWU are understood so they can be incorporated into the design of an outdoor jacket that supports the user's functional, expressive, and aesthetic needs.

**Method.** The researchers employed qualitative research methods, specifically semi-structured interviews with open-ended questions (Patton, 1990). The researchers ensured the validity of the structure by triangulating the data (Beverland & Lindgreen, 2010). Two participants who are GZWU were interviewed through an online meeting software to determine their needs and experiences with outdoor jackets in February 2023. Participant A is a 26-year-old male from Europe with a spinal cord injury. Participant B is a 24-year-old male from the United States with Spina Bifida. Each interview took 45-60 minutes. To further validate the data, the researchers utilized peer review and participant feedback (Fossey et al., 2002).

**Findings. RQ1.** Based on the results of the in-depth interviews with the two participants, the specific requirements of the outdoor jacket for GZWU can be summarized using the FEA Model.

A functional outdoor jacket should be (a) *comfortable* and fit well, allowing for a full range of motion without restricting movement or causing discomfort. Participant A said, "Comfort is my priority when choosing adaptive clothing." Specifically, he suggested "a shorter front to ensure it doesn't bunch up in the abdomen;" "a longer back" and "longer pants" can keep him warm; and "shorter sleeves that don't cover the bottom of my hands" to make it easier for "me to push rim" are all key features that ensure GZWU is comfortable when in a sitting position. In addition, the "seamless technique" is a great way to "reduce pressure," which is especially comfortable for them; and having a "back pocket," "wrinkles," and "anything underneath between you and this chair could be an issue." Moreover, the participant mentioned that he must propel the wheelchair strongly when exercising outdoors. Thus, "enough elbow and shoulder room" is needed to provide more (b) *flexibility*. Therefore, making darts (Inui, 2020) to the elbow and shoulder area could provide more room to facilitate better (c) *mobility* for GZWU. In addition, (d) *accessibility* is essential for GZWU with limited mobility. In other words, the outdoor jacket design for GZWU should be easy to don and doff. Participants recommended using friendly accessories like "Velcro" rather than "regular buttons or hooks." Participant A explained, "Zipper pulls with larger loops would make it easier" for users with "dexterity" or "gripping difficulties to use the zipper." Additionally, while sitting, "using magnetic zippers, magnetic snaps and magnetic snaps is very good for me to access my clothing." Lastly, the outdoor jacket should provide sufficient (e) *protection* against rain, wind, and cold weather. Participant B said that it is easy to sweat when exercising outdoors. "I don't have a spinal cord injury, so I sweat a lot." If an outdoor jacket has "insulated, windproof, waterproof, and moisture wicking" features, it would "make me feel great."

Regarding expressive factors within the FEA Model, GZWU values personal expression through clothing. Participant A said that if he had more options for outdoor jackets, then he could show more of his "personality," "personal style," and "identity." In addition, an outdoor jacket that meets the needs of GZWU can increase self-esteem and confidence, making them "feel part of the community." They believe "cool clothes" is a "conversation starter" and can help GZWU "build some friendships in the community." Furthermore, an attractive outdoor jacket would allow GZWU to express himself better on social media. GZWU hopes to leverage the power of social media to gain more "participation" and "funding" for "better equipment and more opportunities" to continue their outdoor programs.

Regarding the aesthetic factor, the jacket should have a stylish and trendy design that appeals to Gen Z fashion preferences while still meeting the functional needs of a wheelchair user. "Brightly colored or reflective elements" could help them "stand out and express my personality." In addition, "it would be nice to have a combination of comfort and style."

**RQ2.** GZWU faces several challenges when it comes to outdoor jackets. Finding an outdoor jacket that fits their body shape and size can be difficult. Further, accessibility is another challenge, as many outdoor jackets do not have design features such as "easy-to-reach pockets" or "adjustable closures" that will improve the useability of the jacket for wheelchair users. Weather conditions

can also pose a challenge, as certain spinal cord injuries may make it more difficult to regulate body temperature (Zhang et al., 2019). Moreover, finding a durable and long-lasting jacket may also be challenging, as some wheelchair users describe abrasion and wear sleeves and sleeve cuffs due to propelling their wheelchairs. Finally, the cost may be a barrier for some GZWU, as adaptive clothing can often be more expensive than regular clothing.

**Discussion.** This study found that GZWUs need garment details that support their seated position, like longer backs in jackets and seamless structures, to reduce the possibility of pressure sores. Further, the study found that GZWUs had limited options when purchasing outdoor jackets related to their expressive and aesthetic needs. Often the jacket was limited to subdued colors and not the bright colors or features they desired. Therefore, the study found that the FEA model supported the discovery of the functional, expressive, and aesthetic needs of the GZWU consumer and can aid apparel designers when creating an outdoor jacket to accommodate the needs and wants of a GZWU consumer. The outcome of this project can potentially improve apparel access for PWDs and promote inclusivity and diversity in the fashion industry.

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