

# Exploring Innovations in Adaptive Clothing for Elderly People

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## Abstract

In this comprehensive review, we delve into the diverse ways in which adaptive clothing contributes to improving the quality of life for the elderly within the context of a global aging population. It is aimed to analyse the underlying demographic trends, the wide range of age-related conditions that necessitate the use of adaptive clothing, and the design principles that incorporate user-friendly features, including easy fasteners, adjustability, and discreet integration of medical devices. In addition, the review investigates the broad spectrum of physiological and psychological benefits that adaptive clothing provides for the elderly. These include heightened comfort, increased independence, and a boost in self-esteem. Moreover, it conducts a thorough examination of the ever-evolving adaptive clothing product in market and recent technological advancements, emphasizing its expansion as a distinct sector.

## Keywords

Adaptive clothing, elderly, comfort, disabilities, products

## Introduction

Clothing is crucial in elderly care, especially when dressing becomes challenging due to age-related conditions. Adaptive clothing for the elderly is a rapidly growing industry that simplifies the dressing process with features like easy closures, adjustability, and medical device openings. This review explores the significance of adaptive clothing as our society ages rapidly, focusing on its potential to enhance the comfort, independence, and overall quality of life for older adults. Adaptive Clothing Market size was valued at USD 285.66 Million in 2021 and is projected to reach USD 426.74 Million by 2030, growing at a CAGR of 5.18% from 2023 to 2030.



Figure 1

### Smart clothing technologies for elderly

Hexoskin Smart Garments have embedded textile sensors for precise cardiac, respiratory, and activity monitoring. Users can access data through the Hexoskin Connected Health Platform, measuring heart rate, breathing rate, and more. Open Data APIs provide raw health data for customized analytics. Various apps and online dashboards aid in visualizing and interpreting the data for personalized health analysis.



Figure 2

The Sensoria Diabetic Foot Ulcer Boot App coaches patients on their rehab journey. tracks activities like steps, minutes active, minutes resting, and when and for how long the boot is taken off. The app communicates directly with the physician’s cloud system, providing real-time patient updates on a color-coded dashboard.



Figure 3

The smart wheelchair cushion integrates pressure relief, mobile app connectivity and personalized wellness support. The Sensoria Dashboard provides valuable data for treatment plans and remote patient monitoring reimbursement. Maintains connectivity, tracks the journey and receive guidance effortlessly using the user-friendly app. Clinicians monitor well-being via the cloud dashboard. This handcrafted cushion uses memory foam, includes a cooling gel layer, a washable cover, and a pocket for chargers and smartphones, promoting health and reducing ulceration risk.



Figure 4

Siren Socks monitors foot temperature continuously, reducing ulcer risk by 87.5%. Providers stay actively engaged, reviewing data and determining the need for clinic visits. To proactively manage the health, incorporate daily wear of Siren Socks for inflammation detection, which will alert the healthcare provider as needed. Siren Socks monitors foot temperature continuously, reducing ulcer risk by 87.5%. Healthcare providers stay actively involved, assessing data and deciding on the requirement for clinic visits.



Figure 5

The Elitac Wearables Balance Belt, a Class 1 Medical Device, aids individuals with severe balance disorders, including Bilateral Vestibular Loss (BVL) affecting about 81 per 100,000 worldwide. This belt uses haptic feedback to enhance body awareness and balance, enabling independence without external assistance. Integrated sensors and vibration motors help wearers understand and improve their posture and balance subconsciously, offering a significant solution for those facing severe balance challenges.



Figure 6

## Current Market Offerings of Adaptive Clothing Products for Elderly

### Women's Zip-off Leg Pull-on Pants

These versatile pants feature an elastic waist, easy leg access, grip loops, convertible length, convenient pockets, and hassle-free dressing. Their composition consists of a medium-weight brushed twill (98% cotton, 2% spandex), they are easy to care for with machine washability and dryer-friendliness, suitable for year-round wear. Developed to make dressing more convenient and promote the recuperation of leg injuries, the Women's Zip-off Pull-on Pant boasts convertible length, leg openings with touch closures, discreet waistband loops, feminine floral embroidery straight leg design, offering both style and practicality.



Figure 7

### Women's Adaptive Front Snap Closure Bra

The Women's Adaptive Front Snap Closure Bra is designed for comfort and convenience, Underwire-Free, Padding-Free, and with Wide Straps to relieve discomfort. It includes a convenient Easy Snap Closure for speedy dressing. Ideal for post-surgery recovery or those with limited upper arm mobility. Constructed using a soft, stretchy blend comprising 95% Rayon and 5% Spandex, this medium-weight fabric offers support across different temperature conditions. It is simple to care for as it can be machine washed and safely dried in a dryer. Promotes independence and preserves dignity for senior women coping with conditions such as arthritis, multiple sclerosis, or limited dexterity.



Figure 8

## Women's Open Back Hi-Low Pleated Top

The Women's Open Back Hi-Low Pleated Top is designed for assisted dressing with convenience in mind: Open Back Closure: Easily secured with snaps at the shoulders. Ensures full back coverage with 2 overlapping panels. It reduces the risk of exposure by providing more extensive coverage than typical open-back designs. Shoulder snaps prevent discomfort by eliminating pressure points. Quick Struggle-Free dressing and saves time. Made of 95% Polyester/5% Spandex, medium-weight bubble knit. Care: Machine washable and dryer friendly. Features feminine flutter sleeves, a pleated neckline, and a fashionable hi-low silhouette for style and comfort. A fantastic option for those who value both convenience and fashion.



Figure 9

## Men's Recovery Zip Jacket

The Senior Men's Zip Front Jacket is designed for easy dressing and post-surgery recovery. This jacket offers convenience and practicality during recovery with following features.

- Ideal for doctor visits, chemo, and various surgeries.
- Easy Access Dressing:
- Sleeves with snaps for limited mobility.
- Easy for Access:
- Snap openings on sides and sleeves.
- Quick Struggle-Free Dressing:
- Reduces post-surgery arm lifting.
- Convenient Pockets for belongings.
- Made of 90% Polyester/10% Spandex, lightweight and quick-dry.
- Stylish and comfortable.



Figure 10

### Jana Adaptive Set

The Jana Adaptive Set is a comfortable and stylish two-piece ensemble made from lightweight, soft, and durable material (80% Polyester, 17% Viscose, 3% Elastane). Its unique adaptive open back design adds flair, and it comes in two subtle blue colour options. This set is perfect for long-lasting wear.



Figure 11

### Adaptive After-Bath Dress

This dress, made from 80% Polyester, 17% Rayon, and 3% Spandex, provides all-day comfort. It has a discreet back overlap for extra coverage and snap closures at each shoulder for easy dressing by caregivers.



Figure 12

### Adaptive Long Sleeves Polo

This men's long sleeves polo offers both easy dressing with its open-back design and style with fabric options. It's made from a blend of Polyester, Rayon, and Spandex for comfort and versatility.



Figure 13

### Adaptive Men's Gabardine Seatless Pant

These Men's Gabardine Seatless Pants, also known as open-back pants, are sturdy and perfect for everyday wear. They are made from durable and comfortable 100% Polyester material, ensuring they can endure industrial laundry cycles. With silver snaps along the back waistline, they offer convenient and hassle-free changing while providing coverage in upright positions.



Figure 14

### One-Handed Belt

A patented one-handed belt is easy to use and perfect for potty training, special needs, and hand dexterity challenges. Made of genuine leather, it suits any occasion and comes with a removable faux buckle.



Figure 15

## Women's Extra Wide Easy Closure Slippers

These senior-friendly shoes provide an adjustable fit with a large overlap for easy entry and fit adjustment. They feature an easy-touch closure, a removable insole, and a foam spacer for personalized comfort. The slip-resistant rubber sole enhances safety. Constructed from a combination of plush sherpa and corduroy mesh. It's ultra-lightweight design is complemented by a breathable and odour-resistant brushed interior lining.



Figure 16

## Conclusion

The current market for adaptive clothing designed for elderly individuals has made notable progress in improving comfort and convenience. Although there is potential for further improvement, it has effectively met many of the distinctive needs of senior individuals. With the aging population growing, ongoing innovation in this niche is expected.

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