



DESIGN AND DEVELOPMENT OF SUSTAINABLE ADAPTIVE CLOTHING COLLECTIONS

Review paper

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ABSTRACT: Adaptive clothing development encompasses the design, innovation, and functionality of outfits created for individuals with different abilities. This field has evolved in response to changing societal perceptions of users' needs, technological advancements, and historical developments that have shaped the rights and inclusion of people with disabilities. Adaptive clothing plays a crucial role in enhancing quality of life by offering functional and aesthetically considered solutions that address diverse physical and cognitive challenges, thereby supporting greater inclusivity within the fashion industry. Contemporary adaptive clothing increasingly integrates advanced technologies and inclusive design principles to improve usability, accessibility, independence, and dignity. Despite significant progress, challenges persist, particularly the higher costs associated with adaptive clothing, which may limit access for those most in need. In this context, sustainable adaptive textiles represent a promising intersection of environmental responsibility and functional design. The paper outlines major historical shifts in the social understanding of bodily diversity, from early cultural and religious frameworks through industrialisation, the development of welfare systems, and the disability rights movement, to contemporary perspectives. Particular emphasis is placed on the role of textiles, clothing, and material culture in shaping and reflecting societal attitudes. The study also critically examines sustainability in adaptive textiles and clothing, including accessories and footwear, highlighting the growing social and economic importance of this market segment. Sustainability is analysed from material-based, process-related, and design-oriented perspectives. The paper concludes by identifying key challenges in designing sustainable adaptive clothing collections and outlining directions for future research and development.

Keywords: adaptive clothing, fashion, sustainability, inclusive design, universal design.

DIZAJN I RAZVOJ ODRŽIVIH KOLEKCIJA ADAPTIVNE ODEĆE

APSTRAKT: Razvoj adaptivne odeće obuhvata dizajn, inovacije i funkcionalnost odevnih predmeta namenjenih osobama sa različitim sposobnostima. Ova oblast se razvijala kao



odgovor na promene u društvenom razumevanju potreba korisnika, tehnološki napredak i istorijske procese koji su oblikovali prava i inkluziju osoba sa invaliditetom. Adaptivna odeća ima značajnu ulogu u unapređenju kvaliteta života korisnika, jer pruža funkcionalna i estetski promišljena rešenja za različite fizičke i kognitivne izazove, čime doprinosi većoj inkluzivnosti u modnoj industriji. Savremena adaptivna odeća sve više integriše napredne tehnologije i principe inkluzivnog dizajna radi poboljšanja upotrebljivosti, pristupačnosti, samostalnosti i dostojanstva korisnika. Uprkos značajnom napretku, i dalje postoje izazovi, naročito viši troškovi povezani sa adaptivnom odećom, koji mogu ograničiti pristup onima kojima je ona najpotrebnija. U tom kontekstu, održivi adaptivni tekstili predstavljaju obećavajuću sintezu ekološke odgovornosti i funkcionalnog dizajna. Rad prikazuje glavne istorijske promene u društvenom razumevanju telesne raznolikosti, od ranih kulturnih i religijskih okvira, preko industrijalizacije, razvoja sistema socijalne zaštite i pokreta za prava osoba sa invaliditetom, do savremenih perspektiva. Poseban akcenat stavljen je na ulogu tekstila, odeće i materijalne kulture u oblikovanju i odražavanju društvenih stavova. Pored toga, studija kritički razmatra aspekte održivosti adaptivnih tekstila i odeće, uključujući modne dodatke i obuću, ističući rastući društveni i ekonomski značaj ovog tržišnog segmenta. Održivost se analizira iz materijalne, procesne i dizajnerske perspektive. Rad se završava identifikacijom ključnih izazova u dizajniranju održivih adaptivnih kolekcija odeće i ukazivanjem na smernice za buduća istraživanja i razvoj.

Ključne reči: adaptivna odeća, moda, održivost, inkluzivni dizajn, univerzalni dizajn.

1. INTRODUCTION

Adaptive clothing refers to garments specifically designed or modified to meet the needs of individuals with physical disabilities, older adults, the infirm, post-operative patients, and those with arthritis, quadriplegia, or paraplegia. Difficulties may result from an inability to manipulate fastenings or from a limited range of motion needed for independent dressing. Adaptive clothing also makes dressing and undressing easier for caregivers, nurses, and hospital staff, while providing non-restrictive comfort for the wearer. Furthermore, it enables individuals with disabilities and older adults to maintain dignity, exercise some independence in self-care, benefit from improved access to medical devices and care products, both for themselves and for attending healthcare professionals [1].

The global adaptive clothing market was valued at approximately €17.51 billion in 2025. It is projected to grow from €18.93 billion in 2026 to around €30.31 billion by 2034, reflecting a compound annual growth rate (CAGR) of 6.06% over the forecast period. This indicates a steady increase in demand for adaptive clothing, driven by demographic trends, rising awareness of inclusive fashion, and ongoing innovation in textile and clothing products. Adaptive clothing design and development are being driven by growing demand for clothing with specialised, personalised features that match wearers' mobility levels, medical conditions, body types, sizes, and ages. Advances in digital design tools, online platforms, and flexible manufacturing concepts are making personalised adaptive clothing



more accessible, supporting global market growth. In addition, expanding partnerships between manufacturers and retailers and hospitals, rehabilitation centres, and residential care facilities, which require significant use of adaptive products for assisted living, are creating new market opportunities. Ongoing recommendations from healthcare professionals on the use of adaptive clothing to support patients with mobility challenges are also expected to further stimulate product demand [2].

2. HISTORY OF ADAPTIVE CLOTHING

2.1. Attitudes towards disability

Throughout history, perceptions of disability have varied across cultures and periods, with most viewing physical differences as inferior. In ancient Greece and Rome, people with disabilities and physical impairments were often looked down upon and stigmatised. Conversely, some societies regarded disabled individuals as possessing spiritual insight. In certain Indigenous traditions, disabled individuals were considered gifted with unique wisdom, serving as healers, shamans, or storytellers. This reverence often meant that disabled people were integrated into society rather than excluded [3, 4]. During the Middle Ages, many physical and mental health conditions were believed to be caused by demons or explained through religious beliefs about divine intervention. With the Enlightenment of the 17th and 18th centuries, physical and mental impairments came to be understood as having underlying biological causes, some of which could be treated with medical intervention. In the 18th century, families of individuals with disabilities were mainly responsible for their care, while the church was the primary provider of charitable care outside the family [3, 5].

The rise of industrialisation in the 18th and 19th centuries marked a significant turning point in attitudes towards disability. The ability to work in labour-intensive environments became a key measure of value. Disabled individuals were classified as “unfit” for work and excluded from society. At the same time, the institutionalisation of disabled individuals took place, further entrenching harmful stereotypes and beliefs. Asylums were built in remote areas, far from amenities, services, and families. The location of these “places of safety and refuge” made it virtually impossible for families to visit and kept the residents hidden from view. Alongside this concealment, the Victorian era introduced so-called “freak shows”, which involved gathering people with disabilities and abnormalities to be displayed for public viewing. In this way, people with disabilities were portrayed as outsiders, different from the rest of society [3].

In the late 20th century, organised disability rights movements led to legislative milestones such as the Americans with Disabilities Act (ADA), which aimed to dismantle barriers to inclusion and accessibility. Contemporary attitudes increasingly recognise disability as an aspect of human diversity. Despite significant progress, challenges in accepting different abilities persist, including the continuing need for broader societal acceptance and better representation in fashion [6].

Major historical events, particularly wars and economic shifts, have significantly influenced how societies address disability. The number of disabled individuals in society increased sharply, prompting governments to act. Welfare systems were established with

an emphasis on rehabilitation, marking a major shift towards recognising the potential contributions of disabled individuals. Some of the earliest disability welfare systems emerged in ancient China and the Roman Empire to support war veterans. The two World Wars had a particularly profound effect on disability inclusion. Western countries experienced a rise in disabled veterans who demanded improved medical care, employment opportunities and accessibility. These demands helped establish the basis for modern disability policies, including rehabilitation programmes and public accessibility initiatives [4].

2.2. Disability models

The medical model defines disability as a personal characteristic resulting from disease, trauma, or other health conditions, which must be addressed individually by identifying the causes and cures of the impairment or by finding ways to adjust or change behaviour to enable full participation in society. In this model, medical care is considered the primary means of managing disability. Disability is viewed as a defect that medicine and healthcare professionals are expected to fix. This perspective contributes to the stigmatisation, impoverishment, and institutionalisation of disabled individuals [7, 8].

Later, Oliver introduced the social model of disability, based on his belief that individual limitations are not the cause of the problem. Rather, the problem lies in society’s failure to provide appropriate services and to ensure that the needs of disabled people are adequately considered in social organisation. This model was developed mainly by individuals previously labelled as disabled under the medical model of disability, who sought greater opportunities for self-advocacy and autonomy [8].

More recently, disability theory has developed into contemporary critical disability theory, a diverse and interdisciplinary set of theoretical approaches. Critical disability theory analyses disability as a cultural, historical, relational, social and political phenomenon, and presents disability as a methodology applicable to various subjects and phenomena [9, 10].



Figure 1: The development of disability models over time

The transition from the medical to the social, and then to the critical model of disability, shows how disability is understood and how these understandings significantly shape legislation and the development of disability rights. Today, attitudes towards disability remain influenced by historical legacies, yet there is growing recognition of the importance of inclusion and representation. Although challenges persist, the evolution of societal perceptions reflects a gradual shift towards understanding disability as an aspect of human

diversity rather than merely a limitation. This shift is also evident in the development of adaptive clothing, which seeks to meet the needs of individuals with disabilities while promoting dignity and style in personal expression.

2.3. Historical development of adaptive clothing

The evolution of adaptive clothing has been significantly influenced by societal perceptions of disability, advances in textile and clothing technology, and key historical events. Throughout history, adaptive clothing has developed from individualised, necessity-driven solutions into an increasingly recognised field of inclusive design and fashion.

Although the term “adaptive clothing” is relatively new, the practice itself dates back to ancient times. In ancient Egypt and Rome, garments were often modified to accommodate bodily differences, with tunics and togas altered to facilitate mobility and comfort for individuals with impairments [11].

Initially, clothing was tailored to individual needs and often produced collaboratively by wearers and local seamstresses, ensuring functionality alongside cultural and aesthetic considerations. With the industrial revolution, mass manufacturing took precedence, leading to a neglect of inclusive clothing for people with disabilities [12]. In the 19th century, for example, corsets were modified to accommodate women with physical disabilities. These adaptations allowed greater flexibility and ease of movement, ensuring that women with disabilities could still enjoy fashionable clothing without sacrificing comfort. In the late 19th and early 20th centuries, technological innovations began to shape adaptive design, such as the invention of the modern snap (1885), the zipper (1893) and Velcro (1940s). Fastening was simplified, while later developments further enhanced accessibility for individuals with limited dexterity. Despite these advances, adaptive clothing remained largely functional and was frequently associated with medical or institutional contexts rather than fashion [12, 13].

A major shift occurred in the mid-20th century, particularly following WWII. The return of injured veterans increased awareness of the practical challenges faced by disabled individuals, leading to the development of garments designed to support independence. From the 1950s to the 1970s, designers such as Helen Cookman began integrating functionality with aesthetic value, producing collections that addressed both usability and style, although these efforts remained relatively marginal within the broader fashion industry [11–14].

In the late 20th century, adaptive clothing came to be recognised as a distinct category, with specialised brands emerging in the 1980s and the term “adaptive fashion” gaining wider usage. Nevertheless, many garments continued to reflect a “medicalised” aesthetic, prioritising practicality over personal expression [12, 14].

In the 21st century, adaptive clothing has undergone significant transformation, driven by technological innovation, disability activism, and an increasing emphasis on inclusion. Innovations such as magnetic closures, elasticated materials, temperature-regulating and sensory-friendly fabrics, 3D-printed accessories, and designs accommodating prosthetics or seated bodies have improved both functionality and independence. Contemporary adaptive fashion increasingly seeks to reconcile accessibility with style, challenging



historical exclusions and positioning clothing as a means of identity and social participation rather than merely a functional necessity [13, 14]. As the fashion industry continues to embrace inclusivity, the future of adaptive clothing looks promising. Designers are constantly pushing boundaries and finding new ways to create clothing that meets the diverse needs of individuals with disabilities [13].

Overall, the history of adaptive clothing demonstrates a transition from personalised adaptation, through industrial marginalisation, to a modern paradigm of inclusive design, reflecting broader shifts in the understanding of disability as a social, cultural, and physical phenomenon.

3. DESIGN AND DEVELOPMENT OF ADAPTIVE CLOTHING

The design and development of adaptive clothing, accessories, and footwear is a growing interdisciplinary field that brings together principles from fashion design, ergonomics, and healthcare. It focuses on creating garments that meet the specific functional, physical, and psychological needs of individuals with limited mobility, chronic conditions, or age-related impairments. Alongside functional requirements, designers also consider aesthetic value and personal expression, ensuring that functionality does not compromise style. Advances in materials science, textile machinery and processes, digital design technologies, and user-centred design approaches continue to shape the evolution of adaptive clothing, enabling more inclusive, customisable, and widely accessible solutions.

3.1. Benefits of adaptive clothing

Adaptive clothing provides many interconnected benefits for individuals with various challenges, including:

- **improved independence:** adapted styles, closures and fastenings enable quicker, less physically demanding dressing and undressing, giving wearers a sense of self-reliance and dignity [1, 15];
- **increased mobility:** clothing, footwear and accessories that incorporate or are compatible with mobility aids such as wheelchairs, walkers, or braces allow greater freedom of movement and reduce restrictions on daily activities [1];
- **reduced pain and discomfort:** the use of soft, comfortable materials, appropriate construction, labelling and closures helps prevent skin irritation, pain and discomfort associated with sensory sensitivities or medical conditions [1, 15];
- **customised fit:** a range of sizes and styles, including options for different body shapes and proportions, ensures a better fit and increased comfort for individuals with unique physical characteristics [1];
- **stylish, contemporary and discreet design options:** clothing, accessories, and footwear with unobtrusive adaptations meet diverse preferences, allowing individuals to express personal style while benefiting from functional features, thus enhancing confidence and promoting a positive body image [1, 15];
- **facilitated caregiving:** reduced time and effort required for dressing routines contribute to a more efficient and positive caregiving experience [1].

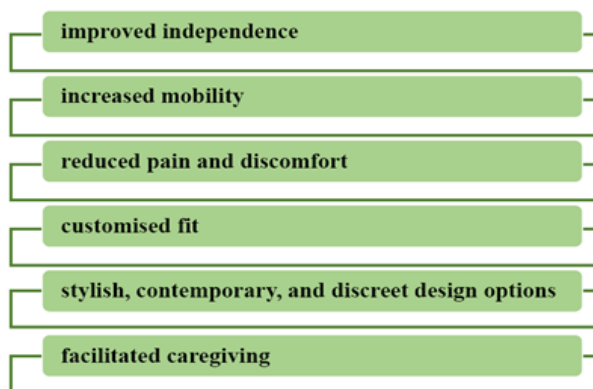


Figure 2: Key benefits of adaptive clothing

3.2. Characteristics and issues in the supply of adaptive clothing

Apart from the special features mentioned in previous chapters, the supply of adaptive clothing is characterised by a relatively limited product range, uneven market development, and varying availability across regions. Persistent issues remain regarding accessibility, affordability, and the extent to which products adequately meet the diverse needs of users. The most prominent characteristics and issues in the supply of adaptive clothing are as follows:

- The high price of adaptive clothing and similar products, due to production costs and small-scale or made-to-measure manufacture, limits demand among middle-income consumer groups worldwide [2].
- The absence of universally accepted design guidelines for adaptive clothing leads to inconsistencies among buyers regarding fit, comfort and functionality, which negatively impacts global product demand [2].
- There is a limited range of adaptive fashion products, and those that do exist often fail to express the personality of the people who need them or to meet all the needs of people with disabilities [16].
- Manufacturers of adaptive clothing and related products often lack knowledge about comfort, functionality and safety requirements and can be intimidated by the challenges of adaptive modifications [16].
- Online shopping, as an increasingly common way of buying textiles and clothing, often does not present adaptive clothing options and makes finding suitable clothing for people with disabilities very difficult [16].

3.3. Sustainability in adaptive clothing

As early as 1992, William McDonough & Partners formulated a set of sustainable design principles for the World Expo 2000. These later became known as “The Hannover Principles: Design for Sustainability”. The document is notable for its broad philosophical



and ethical scope and should be regarded as a living framework, committed to the ongoing transformation and deepening of our understanding of human interdependence with nature and with future generations [17, 18]. The principles are as follows:

- Insist on the right of humanity and nature to coexist in a healthy, supportive, diverse and sustainable condition.
- Recognise interdependence.
- Accept responsibility for the consequences of design decisions on human well-being, the viability of natural systems, and their right to coexist.
- Create safe objects of long-term value.
- Eliminate the concept of waste.
- Rely on natural energy flows.
- Understand the limitations of design.
- Seek constant improvement through the sharing of knowledge.
- Respect the relationships between spirit and matter [17, 18].

Product design and development play a fundamental role in the design and manufacture of sustainable products. The choices made during the product design and development process influence up to 80% of a product's environmental and social impacts. The selection of materials, forms, colours and production systems also affects the use and disposal of the product throughout its life-cycle, and the designer thus also influences sustainable consumption patterns [19]. This is also true for the design of adaptive clothing, footwear and accessories, which is a complex and interdisciplinary process involving a team of professionals with a wide range of expertise.

The adoption of sustainable materials is a key trend reshaping the global adaptive clothing market. Producers are increasingly prioritising environmentally friendly textiles, including organic cotton, recycled polyester, Tencel and hemp. This shift is driven by rising consumer demand for environmentally responsible products and by a broader industry transition towards circular economy principles. Manufacturers increasingly recognise that sustainable materials can reduce environmental impact, align with ethical consumer values and strengthen brand reputation. As a result, this trend is influencing both design and production processes, encouraging innovation in material, textile and clothing development as well as supply chain management. Greater emphasis is placed on durability, biodegradability and the responsible sourcing of raw materials, ensuring that adaptive garments are not only functional but also environmentally responsible. Ultimately, this approach is transforming production practices by embedding environmental awareness at every stage, from material selection through to the end of the product life-cycle [20]. Integrating sustainability principles into adaptive fashion is not merely an ethical consideration but a fundamental necessity:

- **Ethical sourcing and production:** Prioritising ethical labour practices and fair wages throughout the adaptive fashion supply chain is crucial to ensuring that the pursuit of inclusivity does not come at the expense of workers.
- **Environmentally responsible materials:** Using sustainable, eco-friendly materials in adaptive clothing production minimises environmental impact and aligns with

broader sustainability goals, including the use of recycled, upcycled and bio-based fabrics.

- **Circular economy models:** Adopting circular economy principles, such as garment recycling and take-back programmes, reduces waste and promotes resource efficiency within the adaptive fashion sector [20].

3.4. Examples of adaptive clothing collections and brands

As awareness grew, specialised adaptive clothing designers and brands emerged, recognising the diverse needs of the disabled community. They began creating stylish yet functional garments, paving the way for more inclusive fashion. Adaptive fashion became a symbol of empowerment, allowing individuals to dress with independence and confidence [14].

The mistaken belief that there is no history of clothing design for disabled users has had a number of repercussions. Not only is there a long history of clothing designed by and for disabled people, but in some cases it sets a higher standard than later efforts. Between 1955 and 1976, nearly thirty of the United States' top clothing designers created garments to fit disabled bodies under the Functional Fashions line. Brands ranged from high-end sportswear to everyday labels. Leading the charge was designer Helen Cookman, whose own disability was hearing loss, and who was one of the earliest pioneers of modern adaptive fashion. Helen Cookman and New York Times style editor Virginia Pope created functional, fashionable clothing to address the needs of disabled consumers in 1955. The garments included practical features such as side zippers, reinforced seams and crutch-friendly cuts to help disabled people dress independently. Cookman helped formalise adaptive design research in the mid-20th century and collaborated with major U.S. designers to develop items that were both fashionable and accessible. Together with Muriel E. Zimmerman, Cookman published an illustrated guide with information for disabled consumers and designers in 1961. However, after both she and Pope had died by 1978, adaptive fashion shifted away from its fashion emphasis towards functionality [21–23].

Vera Maxwell remained the longest collaborator, incorporating Functional Fashions elements into her garments for ten years. One of her best-known creations, the “Speed Suit”, was designed for disabled bodies. With an elastane-knit top, it slipped over the head with no fastenings and was perfect for “the woman who wants to dress quickly” or “anyone whose fingers are crippled with arthritis”. In 1963, Maxwell released the so-called “Rugby Suit”, a tweed suit that included a matching lap robe for wheelchair users. It fastened with Velcro tape [21, 22, 24].

In 1975, the popular brand Levi's released an accessible pair of jeans that could be ordered by mail. The design was based on Cookman's patented “Trousers for a Handicapped Person”, which featured zippers running the length of both legs and a belt that kept the front in place while the back unzipped for ease of use when going to the bathroom. Cookman died two years before this significant release [21, 23].

Contemporary designer Izzy Camilleri is widely recognised as a pioneer of stylish adaptive fashion. For several decades before founding her brand IZ Adaptive, Camilleri designed for a high-profile celebrity clientele. In 2004, after creating a bespoke garment for a



wheelchair user, she identified a significant gap in the market and the need to make well-designed, aesthetically appealing clothing accessible to a broader range of users. Established in 2009, IZ Adaptive has since been at the forefront of adaptive fashion, addressing the needs of individuals with diverse abilities. Camilleri’s designs offer what may be described as “fashion freedom”, combining comfort, ease of wear, and inclusivity without compromising on style. In September 2025, IZ Adaptive became part of the Silvert’s family, a company that has been a leader in adaptive clothing since 1930 [25, 26]. Joe & Bella is a contemporary adaptive fashion brand founded in 2020 in Chicago, representing a significant shift within the industry towards inclusive, dignity-centred design for ageing and mobility-impaired populations. The company’s conceptual foundation is rooted in the belief that functional clothing should not compromise personal identity, aesthetics or dignity. The brand emerged from a caregiving context, where the founders recognised that existing adaptive garments were often perceived as “ugly” or overly clinical, leading to resistance among older adults. The company emphasises three core principles: dignity and independence, the fusion of style and function, and a universal design philosophy. Joe & Bella not only addresses practical dressing challenges but also helps redefine how ageing and disability are represented within the fashion system [27, 28].

Despite some progress, the fashion industry has long struggled to achieve genuine inclusivity and accessibility, from runway representation to brand practices. Although companies such as Tommy Hilfiger, ASOS, Nike and Zalando have recognised the purchasing power of disabled consumers, they have often failed to meaningfully involve these users in the design processes intended to serve them. As a result, adaptive garments are frequently brought to market without adequate testing by their intended users, leading to shortcomings in functionality. In other cases, products promoted as accessible fail to reach the communities they are designed for [21, 22].

4. CHALLENGES IN THE DEVELOPMENT AND DESIGN OF ADAPTIVE CLOTHING

The design and development of adaptive clothing present a range of complex challenges that require careful consideration of both functional and aesthetic factors. Designers must balance practical concerns such as ease of dressing, accessibility, and compatibility with medical or mobility aids with the desire for visually appealing, contemporary, fashionable clothing. In addition, the diversity of user needs, including variations in age, gender, lifestyle, profession, physical ability, body shape, and medical conditions, makes standardisation difficult and often necessitates highly individualised solutions.

Further challenges arise from material selection, manufacturing constraints, and cost considerations, which can limit both accessibility and affordability. Ensuring that adaptive clothing remains inclusive and commercially viable, with potential for market growth, therefore requires ongoing innovation, interdisciplinary collaboration, and a user-centred design approach.

The key challenges in the development and design of adaptive clothing are as follows:

- **stigma**, which can only be overcome by positioning adaptive clothing and fashion as stylish, desirable and empowering;
- **limited accessibility** caused by users’ lack of awareness of the existence and availability of adaptive clothing, insufficient visibility in mainstream retail environments, and limited marketing efforts by brands;
- **higher production costs** resulting from smaller production scales or made-to-measure manufacturing, specialised design features, and the use of special, high-performance, high-quality materials;
- **lack of standardised sizing and design across brands**, creating considerable challenges for consumers seeking well-fitting garments;
- **special safety measures required** due to the complexity of some types of adaptive clothing, footwear and accessories;
- **lack of standardised design principles**, leading to wide variation in essential features such as easy closures, accessible pockets and adaptive cuts, resulting in an inefficient and discouraging shopping experience for consumers of specialised apparel;
- **specialised knowledge and competencies required** to design adaptive products that meet specific needs, follow ergonomic principles and ensure both accessibility and sustainability;
- **inefficiencies in supply chains and distribution networks** that impede access for a wider customer base;
- **obstacles to implementing sustainable design principles** arising from the use of specific materials, material combinations and specialised components, the integration of complex manufacturing processes, elevated production and distribution costs, and the inherent challenges associated with recycling and upcycling [29, 1].



Figure 3: Key challenges in the development and design of adaptive clothing

5. CONCLUSION

The contemporary design, development and manufacture of adaptive clothing collections reflect broader societal shifts in the understanding of disability, moving from



marginalisation towards co-design, inclusion, diversity and user empowerment. Historical analysis shows that adaptive clothing has progressed from individualised, necessity-driven solutions to an increasingly recognised field of inclusive design, shaped by advances in technology and fashion, changes in social attitudes and the growing influence of disability rights movements and the media.

Today, adaptive clothing is a complex, interdisciplinary field that integrates principles of design, technology, ergonomics, healthcare, sustainability, quality and safety. Although the adaptive clothing market shows significant growth potential, it still faces persistent challenges, including high costs, limited availability, insufficient standardisation and a lack of meaningful user involvement in design processes. These challenges highlight the importance of adopting user-centred, participatory design approaches to ensure that products respond effectively to the diverse and specific needs of end users, including their emotional and aesthetic needs.

Furthermore, integrating sustainability principles into adaptive fashion is no longer optional but essential. It requires responsible material selection, ethical production practices, and the adoption of circular economy models. At the same time, achieving genuine inclusivity demands not only material and functional innovation but also cultural change within the fashion industry, including better representation and accessibility, and an end to disingenuous claims that a product is adaptive when, in fact, it is not and has been created solely to attract media attention and increase market share.

Critically, current approaches in the fashion industry often prioritise commercial opportunity over functional adequacy and social responsibility. As a result, products frequently fail to address users' lived experiences, reinforcing exclusion rather than reducing it. Addressing these issues requires a more rigorous policy framework that incorporates design standards, accessibility regulations and incentives for inclusive innovation.

Future progress in adaptive clothing and related products will depend on sustained interdisciplinary collaboration, technological innovation, and closer alignment between designers, manufacturers, healthcare professionals, and users. Only through such coordinated efforts can adaptive clothing fully realise its potential as both a functional necessity and a means of personal expression, contributing to a more inclusive and sustainable fashion system.

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