



International Journal of Home Science

ISSN: 2395-7476
IJHS 2020; 6(2): 238-241
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www.homesciencejournal.com
Received: 10-03-2020
Accepted: 12-04-2020

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Adaptive clothing for disabled people

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Abstract

Over the years, mental, locomotor, physical, communicational, emotional, mobility and situational are various forms of disability. Among several types of disabilities, clothing is primarily deals with physical disabilities. It is a limitation on a person's physical functioning, mobility, dexterity or stamina. Persons with physical disabilities are also an important component of society. Disabilities have its strong impact on one's ability to move around freely. To address this disability adaptive or functional clothing are designed which helps to minimize joint movements and pain faced by patient while dressing or undressing. It also decreases the amount of patient handling performed by attendant. Thus, it allows making life easier and substantially improving the quality of life for disabled people by a better choice of good looking and functional clothing.

Keywords: Disabilities, clothing, quality

Introduction

A disability is any condition that makes it more difficult for a person to do certain activities or interact with the world around them. These conditions, or impairments, may be cognitive, developmental, intellectual, mental, physical, sensory, or a combination of multiple factors. Impairments causing disability may be present from birth or occur during a person's lifetime. The World Health Organization proposes the following definition of disabilities:

"Disabilities is an umbrella term, covering impairments, activity limitations, and participation restrictions. An impairment is a problem in body function or structure; an activity limitation is a difficulty encountered by an individual in executing a task or action; while a participation restriction is a problem experienced by an individual in involvement in life situations. Disability is not just a health problem. It is a complex phenomenon, reflecting the interaction between features of a person's body and features of the society in which he or she lives." (WHO, 2016).

Thus, Disabilities also often lead to special functional requirements of clothing and textile products. The clothing designed for people with disabilities must allow for greater freedom and independence when worn, it must also be fashionable. Because clothing can act as a form of adornment and provide an expression of self, personal taste and style. This is why it is essential that these products be comfortable, appealing to the eye, trendy, easy to put on/take off, accessible to all those who are disabled, safe and able to adapt to the wearer's physical needs.

These functional garments are used to improve the quality or ease of life for people with disabilities or special needs, like wheelchair users, paraplegics, arthritis sufferers, people with restricted movement or stroke victims. These garments are mostly made-to-measure to ensure individual need fulfillment and comfort for the wearer. This particular type of clothing must satisfy the following requirements that have been given by Wei-Min Chang

- 1) Putting on and off independently and conveniently
- 2) Clothing variation in body features while presenting no distinction from others
- 3) Providing a physical and psychological sense of comfort and stability
- 4) Offering reasonable purchase price and easy to wash and maintain.
- 5) To assure minimum required level of body odour retention by using natural fiber and applying antibacterial treatment.

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Due to emerging technological field, ideas within rehabilitation have also advanced whereby service providers and service users can play equally important roles in finding solutions or methods for persons with a disability to experience a more positive day-to-day life.

Disabled population in India (Census 2011) ^[16]: The number of disabled persons is highest in the age group 10-19 years (46.2 lakhs). 17% of the disabled population is in the age group 10-19 years and 16% of them are in the age group 20-29 years. Elderly (60+ years) disabled constituted 21% of the total disabled at all India level.

Age-group	Persons	Males	Females
0-4	1291332	690351	600981
5-9	1955539	1081598	873941
10-19	4616050	2610174	2005876
20-29	4189839	2418974	1770865
30-39	3635722	2112791	1522931
40-49	3115651	1851640	1264011
50-59	2492429	1430762	1061667
60-69	2657679	1394306	1263373
70-79	1769370	884872	884498
80-89	723585	337170	386415
90+	225571	97409	128162
Total	26810557	14986202	11824355

Material and methods

This article is purely based on secondary data. The data is collected from journals, newspapers, research article, internet and govt. reports.

Different types of adaptive clothes



Zip-off Sleeves



Shoes with velcro



Closure on the back



Front Opening bra



Side Opening Pant

Design features should be considered when designing clothes for people with disability

- Aesthetic:** Clothes is an important part of our appearance and reveal a part of our personality by selecting the clothes. For different types of activity (work, leisure, parties etc.) we usually choose different style of clothing. Properly designed clothes can act as a camouflage concealing possible handicaps.
- Comfort:** Clothing and other textiles which are in close contact with the body must not cause any kind of discomfort. Different aspects of comfort which need to be considered are thermal (insulation and breathability), tactile factors (hand properties), freedom of movement, pressure, non-allergenic, etc.
- Protection:** In certain cases, the textile products are expected to protect us from risks in the environment. For example, outdoor clothing gives protection against rain, wind and cold. In the home, curtains and sunshades give protection against solar radiation, and screens can be used to provide some level of privacy.

What is adaptive clothing?

The term “adaptive clothing” refers to “garments designed with medical function in mind for post-surgery patients, the disabled, elderly, rehabilitation patients, special needs children and adults, people with arthritis, stroke victims, etc.” (Disabled World, 2015). The purpose of adaptive clothing is to have easy access to body parts without taking off the entire garment and making it easier for the people with disability to don and doff by themselves. Example: Instead of using closures in apparel use of Velcro and magnets. So, it should promote independence in dressing by oneself and doing personal care as well as provide ease in the dressing process for the caregiver (Buck & Buck, 2015) ^[3].

Types of modifications in adaptive clothing for disabled people

There are a number of modifications made to conventional clothing designs. It can mean replacing buttons and shoelaces with velcro, placing closures on the back rather than front of garments and creating clothing from special fabrics to address sensory issues.

Front closing bras, side opening pants, slippers that adjust in width to accommodate swollen feet and ankles and seamless socks are additional modifications that make life easier. Lap-over back-style garments with snaps for the individual who cannot raise their arms. Seatless pants to help with incontinence, tagless shirts and weighted vests are other types of adaptive clothing, and compression leggings are also popular. Additionally, adaptive clothing can be custom made to suit individual variations.

- Ease of movement:** It is important to give extra ease in the fabric while designing clothes for people with disability so that it should not restrict body movement. Wang, Wu, Zhao and Li (2014) ^[14] noted that for easy limb movement, location of joints should be given more design consideration.
- Easy access**
 - 1) Location of Openings: Front opening facilitates the process of dressing and undressing independently. Openings should be carefully designed as the person should be able to access independently. Outside seam openings allow the pants to lay flat on a bed or on a chair. Inside seam openings allow for taking care of personal needs without getting undressed or even taking shoes off.
 - 2) Type of Fasteners: Designed adaptive clothing should provide easy access for people with disability to don and doff, providing independence and self-confidence to people. Closures such as buttons, Velcro, zippers with big pull tab and snaps could be used to assist people with disability (Buck & Buck, 2015) ^[3]. Velcro has been the favorite choice for the designers and the manufacturers in adaptive clothing for many years. Many have tried to use

decorative buttons and zippers to conceal Velcro fasteners, allowing easy adjustments and making the garment look like conventional clothing. Magnetic fasteners are applied in clothes replacing hard-to-manipulate buttons or zippers ("Magnetic button clothing" 2016). (Silvert's, 2016).

- f) **Quality:** It is often safer and more economical in the long term to buy products of known brand names, and from retail stores to which the products can be returned if problems with the quality occur, even if the price is a little bit higher. Because purchasing low quality products can make textiles and clothing more expensive in the long term. For example, cheap socks may be worn out after two days of use and have to be replaced by new ones. This becomes more expensive than an original purchase of better quality, durable socks that will withstand tens of washes.
- g) **Fit:** Proper fit of a garment is determined by the relationship of the size of the garment compared to the size of the wearer (Huck, Maganga, & Kim, 1997) ^[9]. Past research studies have demonstrated a significant problem area for fit in protective and functional clothing is in the crotch area (Huck *et al.*, 1997) ^[9]. This can be solved by providing appropriate garment ease. Too much of garment ease may confine leg movements. So, garment should be designed in a way so that it should give appropriate fit and adequate comfort to person.
- h) **Wear and tear:** While designing clothes for disabled users, it is important to consider that it should be durable enough to withstand tearing and breaking when subjected to tension.
- i) **Price:** Most of those individuals do not have much purchasing power as they rely on security funds or similar source of funding. Resources are limited. So, while designing the functional adaptive clothing, the price component had to be considered.
- j) **Shopping facilities:** The supply of products may be dependent on location. Choice and availability will be greater in large cities than in rural areas. For persons with restricted mobility, normal shopping in stores might be impossible, and disabled people are often restricted to mail order shopping, special clothing demonstrations, or assistance from a carer or relative.

Types of adaptive clothing & special needs clothing

Adaptive clothing is specially modified to make dressing easier, improve comfort and promote independence for individuals with disabilities or limited mobility. Many designs for adaptive clothing have smooth seams that cut friction and are even modified to be consistent with the latest fashion norms as much as possible.

- Those suffering from Paraplegia, handed diseases, lag diseases, who have back bone problems and those who have no control on their find it really difficult to move joints or even turn muscles. Their clothes, therefore, are specially adapted with an open rear, which enables them to wear easily put on from the front and removes pointless bend or rotate muscles and joints.
- For individuals who have Alzheimer's disease, protected clothing is the favored choice to make it hard for them to

undress during unsuitable moments.

- Those with Edema disease have their pants finished with a unique design so that the pants can be easily adjusted in size and similarly adaptive shoes. They also have closures that are non-restrictive. Traditional footwear and pants are difficult to wear because of the swelling of legs and feet.
- For those with incontinence disease, their adaptive wear comes specially adapted so that they can be removed speedily, effortlessly and inconspicuously. This clothing comfortably accommodates their limited bladder control and urgency.
- People living with Arthritis and Parkinson's disease have limited motor skills, so their clothing has combined comfortable touch magnetic and Velcro closures, which are better and more efficient than zippers and buttons.

Recommendations

- 1) The need for proper thermal insulation is particularly important for persons with low physical activity in cold outdoor environments, e.g. wheelchair users.
- 2) It is not given any special recommendation value for bursting strength because it was not considered a special problem
- 3) Details on the apparel collection, use and treatment may be integrated into recovery and therapy services.
- 4) Survey a wider sample of physically impaired working people to assess whether common behaviours and activities occurs in clothing.
- 5) Improving retail clothing accessibility by broadening aisles and lowering racks where possible would make shopping a less challenging activities for the disabled person.
- 6) Light colours are recommended for persons who have very sensitive skin.
- 7) The cloths of the disables must be water resistant.

Conclusion

Disabled people needs are not being met due to lack of appropriate clothing, that prevent individual from fully engaging in social activities and relationships, employment or everyday life events. To meet the needs of disabled people adaptive clothes are designed with special properties, capacities and functions such as antibacterial, proper humidity, non-flammable, water proof, wear and cleaning resistant warmth retention. It also includes special features for new adaptive clothing such as easy handling fastenings, quick-access garment openings, conveniently placed pockets, custom-curved trousers, slacks, and jackets, custom-shaped dresses and skirts, ponchos or custom-made coats, easy-fit undergarments, and durable styled fabrics. It helps users to improve their self-esteem by promoting independence in dressing by oneself as well as lessen the physical strain and workload of their domestic care providers.

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