

# A Study on Comfort Related Properties of Adaptive Clothing

Pavithra Shen G T<sup>1,\*</sup>, Dr. Krishnaveni V<sup>2</sup>, Affincy S R<sup>3</sup>

<sup>1\*</sup>M.Tech Scholar, Department of Fashion Technology, Kumaraguru College of Technology, Coimbatore -641049, Tamilnadu, India

<sup>2</sup>Associate Professor, Department of Fashion Technology, Kumaraguru College of Technology, Coimbatore - 641049, Tamilnadu, India

<sup>3</sup>M.Tech Scholar, Department of Fashion Technology, Kumaraguru College of Technology, Coimbatore -641049, Tamilnadu, India

-----\*\*\*-----

**Abstract** - Mental, locomotor, physical, communicational, emotional, mobility, and situational disabilities have all evolved over time. Clothing is mostly concerned with physical limitations among different types of disabilities. It is a physical constraint which will affect a person's locomotion, dexterity, or stamina; physically disabled people are a vital part of society. Disabilities have a significant influence based on person's ability to move freely special or functional clothing is used to address the handicap people. Adaptive clothing is created to help patients to decrease joint motions and pain while dressing or bathing.

**Keywords:** Clothing, Disabilities, Quality

## 1. INTRODUCTION

Any condition that makes it more difficult for a person to undertake specific activities or interact with the world around them is referred to as a disability. Developmental, Cognitive, psychological, intellectual, physical, sense factors or a combination of two or more factors may cause these disorders or deficiencies. Disability is term which includes the limitation in participation, limitation in the activity and includes disability. Disability is a problem with body function or structure; an activity limit is a difficulty that an individual encounters in performing a task or an action; an individual's participation in life situations. Disability is not just a health problem. It is complex thing that mirrors an interplay inbetween the features of a body and the society in where they are living in.[1]

Since then, there have been many advancements in design, materials used, finishing touches, ease of wear, functionality for specific needs, aesthetics, accessibility, durability, mechanical properties, etc. performance and affordability, to name a few [4].

## 2. Adaptive clothing

Adaptive clothing is made to meet the specific demands of people with impairments and special needs. This can involve concerns such as poor motor control, abnormal limb growth, or wheelchair use, all of which might limit the use of traditional apparel.

Adaptive clothing is meant to avoid buttons, zippers, and snaps, which can be a difficulty for people with special needs. Wearing clothes can be bothersome and difficult for people with sensory processing problems, thus this is another area where adaptive clothing designers are focusing their efforts. [2]

Wei-min chang has specified that this style of garment must meet the following specifications.

- 1) Put on and take off independently and conveniently
- 2) Clothing that changes in physical characteristics but does not show any difference from others
- 3) Offers a reasonable purchase price and is easy to maintain by hand
- 4) Provides comfort and stability physically and psychologically
- 5) To ensure the maintenance of body odor to the minimum required through the use of natural fibers and the application of antibacterial treatments.[1]

## 3. Designing clothes for disabled people

The design of this functional and woven garment goes beyond the well-known conventional boundaries, interweaving with other fields such as biotechnology, medicine and computing to meet the needs for the world with complex and multifaceted needs of user including the people having disabilities. [5] Over the years, various researches have been carried out and led to the invention of personalized clothing that responds to the characteristics, manifestation and the person's effect of certain variability of disability. Disability to the lives of those involved. [6]

Furthermore, these unique textile goods must have unique functionalities and be made from textiles with unique qualities, such as:

Some tactile qualities, particularly when the thing is new aimed at those with sensitive skin. Thermal comfort, which is critical for persons living in colder climates.[7,8]Should be able to eliminate humidity produced by perspiration (one of the most common issues), require dehumidification and

adequate air circulation [9, and as a result of this they are often endowed with the stronger muscles and more flexible joint. [10]By employing natural fibres and/or using antibacterial treatments or antibacterial finishes, the minimal required amount of body odour retention can be achieved. To ensure adequate insulation through the use of suitable fabrics while reducing the volume and weight of the product. [3]It should be easy to maintain the cloth and clean in the washing machine like regular cloth laundry with a high wrinkle resistance and an easy recovery when it is folded. Can control the handicap. To provide the required level of safety and comfort. Provide the necessary support mentally and psychologically. Easy to store and wash in the washing machine like regular laundry, with high wrinkle resistance and easy retrieval after folding. [11]

#### 4. Pattern modification

Anthropometric Characteristics: Previous research has analysed the anthropometric parameters of people with and without disabilities and discovered notable discrepancies. When a body is standing versus sitting, it is critical to grasp the distinctions in measurement, such as: "Hip bones expand out." When a person sits for an extended period of time, the stomach muscles do not operate as well. When seated, the waistline thickens as fat and muscle expand across the buttocks and thighs. As a result, while creating a pattern for a garment, all of these alterations should be taken into account.[12]

##### 4.1 Ease of Movement

When designing trousers, it is critical to remember that they should not hinder bodily movement. Easy limb mobility and joint location should be given more design consideration, according to our findings.[13]

##### 4.2 Easy Access

The front side opening makes the process of dressing and undressing easier. Openings should be properly created so that the person can get in and out on their own. The pants can be laid flat on a bed or in a chair thanks to the outside seam holes. Inside seam openings allow you to take care of personal needs without undressing or even removing your shoes.

##### 4.3 Types of fastener

Adaptive clothing should be easy to put on and take off for people with disabilities, offering them independence and self-confidence. To assist persons with disabilities, buttons, Velcro, zippers with a wide pull tab, and snaps could all be employed. Designers and producers in the adaptable garment sector have preferred Velcro for many years. Many people have tried to hide Velcro fasteners under lovely buttons and zippers, allowing for quick changes while keeping the garment's aesthetic. Clothing with difficult-to-manipulate buttons and zippers is replaced with magnetic closures.[14]

#### 4.5 Fit

The relationship between the size of clothing and the person's desire how well the design will fit the person who worn it. The crotch area has been identified as a significant concern area for fit in protective and functional garments in previous research investigations. This can be avoided by allowing for proper clothing ease. Leg movements may be restricted if the garment is too loose. [15]

Type and placement of seam: To reduce skin irritation and pressure ulcers, seams should be strategically located and made as flat as feasible. Heavy weight textiles cause thick seams, which is a serious concern. These seams or stitches may irritate softer skin and can lead to pressure sores. To solve this problem, the seams or stitches must be positioned very carefully.

Accommodation for concealing medical devices and related accessories: Trousers should be designed in such a way that medical equipment such as catheters are hidden. The tubing of a Foley catheter could be maintained in place via a channel sewed into the trousers. A drainage bag might be placed in a pocket on the bottom portion of their pants, with a disguised hole to drain the bag as needed from the outside without having to remove the pants and expose the bag. Folds and pleats in adapted clothes are used by companies like Buck & Buck to disguise connections for feeding tubes, catheters, and other medical devices.[12]

#### 5. Brands making adaptive clothing

- Unhidden Clothing - London, UK based brand manufacturing Tops, dresses, & bottoms for all genders.
- Braille Code Brands - Brooklyn, NY based brand manufacturing Socks & patches.
- Miga Swimwear - New York, NY based brand manufacturing Women's swimwear, cut out top & pants
- Friendly Shoes - San Diego, CA based brand manufacturing Adaptive footwear for all genders
- Slick Chicks - Brooklyn, NY based brand manufacturing Women's underwear
- Care + Wear - New York, NY based brand manufacturing Health wear for all genders & ages
- Veja - Paris, France based brand manufacturing Velcro shoes.



Fig - 1: Braille Shoes



Fig - 2: Friendly Shoes



Fig - 3: Slick Chicks

## 6. CONCLUSIONS

The needs of disabled persons are not being satisfied owing to a lack of appropriate attire, which prevents them from fully participating in social activities and relationships, job, or education. Occurrences in everyday life To satisfy the requirements of those who are impaired

Adaptive clothing is made with unique features in mind.

Antibacterial, antifungal, antiviral, antifungal, antibacterial, antiviral, antiviral, humidity, non-flammability, water resistance, wear ability, and cleanliness. Warmth retention is resistant. It also has features unique to creative tailoring, such as easy-to-handle closure, easy-access garment opening, easy-to-locate pockets and more., and easy-to-wear coats, dresses and skirts, coats or coats, underwear, and durable materials. It aids users in Boost their self-esteem by encouraging independence in the classroom. Clothing themselves is a good way to reduce physical effort and save money and their domestic care providers' workload.

## 7. Considerations in Garment design for the Differently Abled

Limitations in the range of regular physical activity leads to functional requirements in clothing and other textile products. When designing clothes for people with disabilities, keep in mind difficulty in movement, reduced range and overall physical, psychological, and social embarrassment that these people have to fight every day. Many people living with disabilities are using advanced assistive devices or machines such as canes, walkers, scooters and wheelchair; need to change clothes to accommodate such devices. Possible physical disability often accompanied by loss of coordination, loss of sensation and imbalance. Many people may also use a urinary catheter or urinal bags need more leg room in pants and skirts. In addition, most casual clothing does not adapt to hip and knee curvature or abnormal body shape due to deformations. People with easily irritated skin should wear it clothing with non-invasive seams, soft and breathable material 13. This must also be considered while Designing clothes for people who are living with disabilities [14].

## 8. Significant Advances that made in this field globally

Limited Disability Goods and not always keeping up with current fashion trends. In recent years, some designers have noticed .Go and create clothes that match function, to meet these needs. Industry experts agree that the ultimate goal have increased autonomy at home, at work and at school. Some significant progresses are: According to a recent report, clothing manufacturers play an essential role in helping people with disabilities by providing more appropriate clothing for Commit, work and exercise. Less attractive Functional clothing helps disabled people stay away wedding, school ball, funeral, baseball game and graduated, back home. This study supports the need for the new clothing styles and designs which may help to get rid of clothing issues faced by the people with disabilities [9]

## REFERENCES

- [1]Neenu Poonia and Pinki "Adaptive clothing for disabled people" International Journal of Home Science 2020; 6(2): 238-241
- [2] Weiss, T. C. (2013). Hypothermia (Cold Stress) - Symptoms, Treatment and Prevention. <http://www.disabled-world.com/medical/first-aid/cold-stress.php> accessed 13 August 2014.
- [3]Deepti Pargai1, Manisha Gahlot, Anita Rani. Designing and Construction of Functional Clothing for a Child with Disability: A Step Towards The Social Responsibility. The International Journal of Social Sciences and Humanities Invention. 2015; 2(9):1534- 1541.

[4] Ayachit, S., & Thakur, M. (2017). Functional Clothing for The Differently Abled. Indian Journal of Public Health Research & Development, 8.

[5] Gupa, D. (2011). Functional clothing – Definition and classification, Indian Journal of Fibre & Textile Research, Vol. 36, December 2011, pp. 321-326.

[6] Shaari, N., Suleiman, N. (2009). Assistive Clothing for Disable People based on Kansei Approach Using Indigenous Clothing Construction, <http://www.iasdr2009.org/Papers/> accessed 7 August 2014

[7] Amrit, U. R. (2007). Bedding Textiles and Their Influence on Thermal Comfort and Sleep, AUTEK Research Journal, Vol. 8, No.4, December 2007 © AUTEK, pp. 252-254

[8] Rehim, Zeinab S. Abdel., Saad, M. M., Shakanker, M. El., Hanafy, I. (2006). Textile Fabrics as Thermal Insulators, AUTEK Research Journal, Vol. 6, No 3, September 2006 © AUTEK, 148-161.

[9] Dutkiewicz, Jacek K. (2006). Cellulosic Fiber for Odor and PH Control, AUTEK Research Journal, Vol. 6, No 2, June 2006 © AUTEK, 91-101, 91-101.

[10] Chang, W. M., Zhao, Y. Z., Guo, R. P., Wang, Q., Gu, X. D. (2009). Design and Study of Clothing Structure for People with Limb Disabilities, Journal of Fiber Bioengineering and Informatics, Vol. 2, No.2, pp. 61-66

[11] Curteza Antonela, Cretu Viorica, Macovei Laura, Poboroniuc Marian. Designing functional clothes for persons with locomotor disabilities, AUTEK Research Journal, Vol. 14, No 4, December 2014, DOI: 10.2478/aut-2014-0028 © AUTEK

[12] Das, B., & Kozey, J. W. (1999). Structural anthropometric measurements for wheelchair mobile adults. Applied ergonomics, 30(5), 385-390.

[13] Wang, Y., Wu, D., Zhao, M., & Li, J. (2014). Evaluation on an ergonomic design of functional clothing for wheelchair users. Applied ergonomics, 45(3), 550-555

[14] Buck & Buck. (2015). Adaptive Clothing Guide. Retrieved from <http://www.buckandbuck.com/adaptive-clothing-guide/adaptive-clothing.html>

[15] Huck, J., Maganga, O., & Kim, Y. (1997). Protective overalls: evaluation of garment design and fit. International journal of clothing science and technology, 9(1), 45-61.