

# Special Clothing for Physically Disabled and Elderly

Jyoti Sharawat<sup>1</sup> and Ashish Hooda<sup>2</sup>

<sup>1</sup>M.Tech Student, Department of Fashion Technology, BPSMV

<sup>2</sup>Department of Fashion Technology, BPSMV

E-mail: <sup>1</sup>sharawat.418.jyoti@gmail.com, <sup>2</sup>ashishhooda2131@gmail.com

---

**Abstract**—Clothing plays an important role in the overall personality of any individual. Aesthetics has vital role be it a high fashion or a garment meant for special need. Physically disabled and elderly people are unable to move their body properly and are not able to do their work. They need to rely on others, such as dressing-undressing, toilet, feeding etc. even for small things. They are completely dependent on others. This research paper, focuses on dressing-undressing problems of physically disabled and elderly people, especially wheelchair patients and offering them functional clothes with aesthetics. It has been observed that being dependent on others; they feel embarrassed for their physical disabilities and in capabilities. Wheelchair's patients are completely or partially disabled below waist. Disabled people have limited options for their clothing. They require comfortable clothing with fashionable look in context to at least hide the functional aspect given to the special garment. They want to look good, beautiful like other people. For sensitive skin patients they should consider the sensory properties and avoid clothing made with stiff sewing. Wheelchair users and individuals, who are lying on the bed for a long time, have to face poor blood circulation and low energy production due to low mobility. For them, thermal properties and good absorbent properties in clothing are important for moisturizing skin. After evaluating the difficulties of physically disabled and the elderly, some designs were prepared. These designs led to final garments specially designed according to wheelchair users and were prepared for both men and women, considering both Indian and western patterns.

**Keywords:** Physically disabled, Elderly, Dressing – undressing problem, Functional garment, Clothing for Wheelchair patients.

## 1. INTRODUCTION

Physical disabled and elderly people are different from normal people. Humans are the special creation of God. Humans are capable to doing all their work and also help other humans, animals, birds etc. Humans have this ability but some people lose their ability. Disabled ones lose their ability due to some accident, illness or from birth. Normal humans can do all their work but physically disabled people lose ability to do their own work. Muscular weaknesses, low mobility in hands and legs, low bone strength, fracture of bone, crippling etc. these passive individuals are disabled. They are not able to carry their bodies due to injuries, due to illness, due to accident or due to birth. These people cannot even work on their daily

routines like food, toilets, and dressing-undressing. They depend on others for their daily routine work. This paper is concentrated on the unconventional problems of physical disabilities, especially the wheelchair patient's dressing problems. Wheelchair patients are unable to move their body properly. They lose partial or complete sensation in part of their lower body. Wheelchairs patients can have various types of disabilities; they are either one foot, one arm, one-sided, partially or completely disabled. Wheelchair patients need extra care because they are unable to walk. They have to sit for long periods of time and rely on others. Carers are essential for them, for feeding, toilets, dressing and for washing clothes. Physically disabled feel embarrassed due to dependence on others. In this paper, the focus has been on resolving the dressing problems of wheelchair patients and disabled. To make their life easier, special clothing has been prepared. Functional clothing is different from normal wear, but disabled ones do not want to look different from other people with these functional clothing. Therefore, they want simple and normal appearance with functionality clothes. In this paper, clothes have been prepared to satisfy both aspects of performance and beauty.

## 1.2. OBJECTIVE

- To understand the clothing problems of physical disabled and elderly.
- Analyze their clothing problems and provide solution of their problems.
- Design special (functional) garments for wheelchair patients and elderly.

## 2. SELECTION OF MATERIAL

### 2.1 SELECTION OF FABRIC

Fabric/textile is very important for physical disabled. Different types of fabrics have their own properties. Wheelchair patients lose partial or completely mobility of legs and arms. Some patients completely lose mobility in lower part of the body. When the lower parts of body are weak, then there are fewer activities in lower part and due to poor mobility, much

temperature cannot arise, which creates coolness in their body and lower part. Therefore, they require heat for their body and their lower part. Clothes that provide warmth are very important for the wheelchair patients and for disabled people. Thermal properties are necessary in fabric. Wheelchair patients are sitting for long periods of time. Therefore, lower part comes to sweat and in the event of continuous seating, the skin is in contact with the surface of the cloth. Therefore, good absorption is necessary for wheelchair patients with the necessary tactile properties in cloth. For wheelchair patients, those clothes are required which are durable, good breathing, warmth, with good absorption and less static charge. Wheelchair patients need heat on the lower part. So, the wool and wool blend clothes are good for them. Acrylic-cotton blend cloth was used to make garments. Cotton fabric has good absorption and breath quality. Cotton and cotton blends are selected for the garments because patients are in long sitting position, sweat occur during this and cotton is the best choice for absorption. Polyester and Lycra blends have also been selected to make garment for wheelchair patients. Polyester is good for insulation and Lycra blends provides good stretch and proper fit according to different type of figure.

## 2.2. SELECTION OF TRIMS

To make functional garments, some trims are used to provide functionality:

**2.2.1. Separated Zipper** A Separated zipper is used to connect two panels of garment. Separated zipper is divided into two parts. Two parts are sewn with two panels of garments and the zipper is closed and both panels are added. It is used in place of seam, at front opening, back opening, side seam of pants and skirt.

**2.2.2. Velcro tape** Velcro tape has two parts and they stick together. It was Sewn on both parts of two different panels of fabric and then pasted together. Velcro tape is used at waistband, cuffs, collar, hem, and front-back opening and also at seams. This is used in place of fasteners, to avoid extra additional efforts. Square and long pieces are sewn at side seam, waistband and front- back opening.

**2.2.3. Elastic** Elastic provides proper fit to body. It provides appropriate fit in different size of waist on the waistband. Elastic provide proper grip at waist, cuffs. It used at waistband, cuffs, waist to bodice and tops etc.

**2.2.4. Snap fasteners** Snap fasteners are perfect replacement of buttons. It has two parts. The two parts are sewn on two panels of garments, so that both panels snap fasteners can be folded together and combined. Those who are unable to catch small buttons and lock them, they can easily open fasteners and close them. This makes life easier for them, it is used in the front-back of the clothes, cuffs etc.

## 3. DESIGNING CLOTHING FOR WHEELCHAIR PATIENTS

With the help of above mentioned fabric and trims, garments were prepared for wheelchair patients. These garments have been prepared for design purposes. These garments have been prepared for both men and women in Western and Indian patterns. In local areas, some women are reluctant to wear western garments. So, some Indian designs were also prepared for them.

### 3.1 WOMEN GOWN

This is a gown prepared for women. Wheelchair patients and elderly women can wear this gown (fig.1). Velcro tape has been used in the back opening of the gown. It helps in dressing – undressing of women who use wheelchairs and who cannot raise their hands above the head. Velcro tape is used on back opening along with full length. This makes the patient independent and helps the person taking care of the patient. Helps them to dress up easily without any extra effort (fig.2)



Fig.1- Ladies gown



Fig.2- Velcro used at back opening

### 3.2 WOMEN KURTI

This Kurti have been prepared for physical disabled women. This garment is prepared according to Indian pattern for Indian women(fig.3). Velcro tape has been used at one side of shoulder, sleeve and at side seam. It helps in dressing–undressing to physical disabled. Those women who have weakness in hand muscles and joints, are unable to raise their hands properly, can independently dress-undress themselves. Disabled don't need to raise their hands over the head due to this functionality. (Fig.4,5).



Fig.3-Women kurti

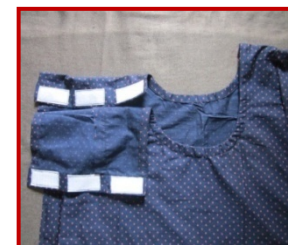


Fig.5-Velcro at shoulder



Fig.4-Velcro at side seam

### 3.3 WOMEN SALWAR

Salwar is a type of lower wear garment which is popular for women in India (Fig.6). Elastic is used at waistband to provide proper grip or fit. Generally a strap is used in salwar at waistband portion. This strap is used to make knot and it helps to hold the salwar at the waist but the women who have disability in hands, their fingers cannot properly grip the strap making it tough to tie. So elastic at waistband helps them to provide proper fit and make them independent. Velcro tape has been also used at upper portion of salwar. This functionality provides more comfort in wearing clothes because muscle weakness makes them unable to apply additional force on the waistband (Fig.7).



Fig.6- Women Salwar

Fig.7-Elastic at waistband and Velcro at side upper portion of salwar

### 3.4 LOWER PANTS

This is a normal lower pant worn by both men and women (fig.8). Wheelchair patients spend most of their time in sitting position. When they are sitting regularly, the back portion of their pants goes down, it is very inconvenient. So, the back portion on the waistband in the lower pants has been increased compared to the front panel. When they are in a sitting position, it provides comfort to those who wear it (Fig.9).



Fig.8 – Lower Pants

Fig.9-Back portion rose for wheelchair patient

### 3.5 SHIRT FOR MEN

Velcro tape has been used on front opening of shirt. Separated zipper is used at back opening of shirt. It makes dressing – undressing easier for physically disabled. Velcro tape is good replacement of buttons on front opening. The ones whose fingers are disabled are unable to catch buttons and are unable to raise their hands over the head. So Velcro makes it easy for them (Fig.10). Separated zipper is used to easily separate two panels of the back part. Wheelchair patients are dependent on others. It also reduces the effort of the person who helps the patient in dressing-undressing. For wheelchair patients, front and back opening is perfect (Fig.11).



Fig.10-Shirt with Velcro at front opening



Fig.11-Separated zipper used at back opening

### 3.6 SHIRT FOR WHEELCHAIR USER

This Shirt is made for women but this functionality can be used for both men and women. This shirt has been designed for wheelchair patients. Patient with weakness in hand and fingers are unable to handle buttons. So, snap fasteners are used instead of buttons at front opening because it consumes less time and force (Fig.12). During the sitting position the lower portion of body is extended. Back portion of the upper bodice is suppressed by the hips in sitting position; it is



uncomfortable for the patient and also for the care giver in changing clothes. So, the excess fabric has been cut off from back portion. Separated zipper is used at back portion (10" down from neck). Removable elastic strap with Velcro has been used at lower part of back portion, to provide fullness and proper fit. If patient wants some fullness then this strap can be removed (in sitting position). This functionality is also useful for the care giver of patient. This shirt is also good in appearance (Fig.13).



**Fig.12-Shirt with snap fasteners at front opening**



**Fig.13-Separated zipper and elastic strap with Velcro tape used at back opening**

### 3.8 TROUSER PANTS

This trouser pants has been prepared for wheelchair patients (Fig.15). Velcro tape has been used at waistband in place of fasteners. It consumes less time and effort. It avoids hazards from sharp fasteners (Fig.16). Separated zipper has been used at both sides of pants. It helps to separate both panels of pants. It makes easy dressing undressing. For wheelchair patients it's difficult to dress undress in sitting position. So, separated zipper is used at side opening, helps the disabled and care giver to do dressing-undressing. Both panels can be easily separated (Fig17).



**Fig.15-Trouser for men**

### 3.7 DENIM PANTS WITH ELASTIC

Physically disabled need functional clothes but they also want to looks good. They want functional clothes but with aesthetic satisfaction. So elastic with extra piece of fabric is used at waistband. Patients with sensitive skin, weak muscles and wheelchair user all can use this type of clothing. With the use of elastic at waistband, we can avoid sharp fasteners. Fasteners cannot be easily handled by muscular weakened patients and fasteners can be irritating for the wheelchair patients and for those with sensitive for sitting position. Elastic used in denim pants provide functionality with good appearance (Fig.14).



**Fig.14-Denim pants with elastic at waistband**



**Fig.16, 17-Velcro used at place of fasteners and separated zipper used at side portion**

### 3.9 TROUSER PANTS

This trouser pants is prepared for wheelchair patient and caliper users (Fig.18). Velcro tape has been used at front waist opening. It consumes less time and effort (Fig.19). Velcro tape has been used at lower portion of both pants. Those who wear leg braces need fullness in lower portion of their pants, trousers etc. So, with the use of Velcro tape at lower portion appropriate fullness and comfort can be achieved for the

wearer. People with leg braces can easily dress up themselves without any discomfort, due to this functionality (Fig.20).



**Fig. 18-Trouser with Velcro**



**Fig.19, 20-Velcro used at waist opening and at lower portion of both pants**

### 3.10 LAYERED SKIRT FOR DISABLED WOMEN

Women who are crippled below the waist have low mobility and they need warmth around their feet because they feel cold due to poor energy generation. Layered skirt has been prepared for those women. Cotton fabric is used as lining in the skirt (fig.21). Square pieces of Velcro tape are used on side opening. With this functionality, they can easily put on/put off the skirt (fig.22). Separated zipper has been used on the other side seam of skirt (fig.23). With these functionality, separated zipper and Velcro tape partially open from hem and the back panel of skirt can raised up. If only the back panel is required to be raised then no need to put off the whole skirt for toileting. It's comfortable for wearer and also for care giver.



**Fig.21-Layered Skirt**



**Fig.22, 23- Separated zipper and Velcro tape used at both side seams**

## 4. RESULT & DISCUSSION

The aim of this paper was to understand and analyze the problems of the physically challenged and elderly people. After analyzing the problem of clothing of physical disabled, it was found that the main problem was dressing-undressing. Above discussed garments were prepared, to resolve their dressing-undressing problem. After discussing about functional clothing with physical disabled, they also showed their interest in functional garments. They also want functionality in their garments, which make their lives easier and reduce their extra efforts. After the discussion they were able to differentiate between normal garments and functional garments. They want comfortable clothes with functionality. One major problem is also that most of people do not know about functional garments and these garments are not available in local areas as well. Only big brands sell these clothes at high prices. People are ready to use functional garments but are not able to spend extra money on functional

clothing. Only few people are ready to spend extra money for functional clothes. The above mentioned garments are prepared to make their life easier. With the use of these garments, disabled ones are able to independently dress-undress themselves. Trims are used in garments, the time and force required to put on and off these garments is greatly reduced. These garments are also useful for the care givers and will make their effort lesser than before.

## 5. CONCLUSION

After interviewing the physical disabled and elderly people, understanding was developed regarding their clothing problems. After understanding the problem areas, some functional garments were designed and finally constructed for physical disabled and elderly, especially for the wheelchair users. Garments were prepared according to the comfort of physically disabled with some special trims were used in western and Indian pattern. Garments were prepared for the wheelchair users, to make them independent. Velcro tape, Separated zippers, elastic, snap fasteners were used to prepare these garments. Velcro Tape used at side seam and shoulder of women kurti helped decrease the effort of physical disabled. Velcro tape was used at back opening of women gown. Women who have low muscular strength in their hands or wheelchair users can wear this gown. It is comfortable for them and also easy for the person assisting the disabled. Velcro is also used at waistband of trouser pants to replace fasteners and buttons. Velcro is also used at lower side seam of trouser for caliper users. Separated zippers, snap fasteners were used at front opening and back opening of shirts. These all trims provided the much needed functionality to these garments to make life easy for physical disabled and elderly. These all garments are comfortable to wear as well as enhance the look of wearer. An acceptance test at the end proved the success and encouraged the effort made in designing of these special garments.

## REFERENCES

- [1] Adeline M. Hoffman, Ph.D. — Clothing for the Handicapped, the Aged, and Other People with Special Needs, Charles C Thomas published, 1979
- [2] Mona, Mark Man Nga, “Study and design of elderly aesthetic apparel”, 2011, 37-38.
- [3] Li-Chen Ou, M. Ronnier Luo, Andree Woodcock, Angela Wright — A Study of Colour Emotion and Colour Preference. Part 1: Colour Emotions for Single Colours, Colour Research and Application, Volume 29, Number 3, June 2004
- [4] Pamela J. Brown, Janis Stone, Laura Sternweis, Carolyn Kundel, Consumer Choices - Clothing ideas for people with special needs. Pm-570 Revised June 2003
- [5] Meinander, Harriet & Varheenmaa, Minna, “Clothing and textiles for disabled and elderly people” 2002
- [6] “Clothing for people with physical handicaps”. A Pacific Northwest Extension publication, Oregon; Washington; Idaho, PNW 222, January 1983
- [7] Elaine E. Clulow, The Shirley institute Manchester “Clothes for the handicapped”
- [8] Nellie Thornton, “Fashion for disabled people”, B.T. Batsford Ltd London published, 1990
- [9] Jane McCann, David Bryson, “Smart clothes and wearable technology”, Woodhead publishing, 2009
- [10] Nell Eda Fowler, “The design and evaluation of selected fashionable garments for A paraplegic teen age girl” 1973 (1977 F787 d cop. 2)
- [11] Benktzon, M. “Clothing and disability. Functional impairments and their importance for clothing”, STO information no. 173-1980, Stockholm: Liber Tryck, 1980, 128 p.
- [12] Epp, Alexander G. “all about the wheelchair, everything about types, clothing and accessories, Inside tips from wheelchair user” Known as : thus you save money, Stuttgart: TRIAS, 1998.p. ISBN 3-89373-445-7
- [13] Make Everyday life easier-on the aids and interior design of the home. Taastrup: Assistive technology Institute, 1995.89 p. ISBN 87-89407-49-0
- [14] Hernández, N. Tailoring the unique figure. Göteborg: Göteborg University, Department of Home Economics, 2000. 138 p. (Research report 30). ISSN 1403-7033
- [15] Meinander, H. & Varheenmaa, M. Definition of critical fabric properties and relevant test methods. DE 3002 EASYTEX deliverable 5.1. Project report. VTT Chemical technology, 1997. 16 p. + annexes 27 p. (unpublished)
- [16] Varheenmaa, M., Meinander, H. & Mamalis, P. Results of laboratory tests, suggestions for limiting values. DE 3002 EASYTEX deliverable 5.3. Project report. VTT Chemical technology and CLOTEFI S.A. 2000. 89 p. + annexes 53 p. (unpublished)
- [17] Meinander, H. & Varheenmaa, M. Definition of special furnishing textiles. DE 3002 EASYTEX deliverable 6.1. Project report. VTT Chemical technology, 1997. 17 p. + annexes 30 p. (unpublished)
- [18] Varheenmaa, M. & Meinander, H. Textiles for medical uses. DE 3002 EASYTEX deliverable 6.2. Project report. VTT Chemical technology, 1998. 19 p. + annexes 5 p. (unpublished)
- [19] Varheenmaa, M. & Meinander, H. Textiles for personal and intimate care. DE 3002 EASYTEX deliverable 6.3. Project report. VTT Chemical technology, 1999. 20 p. + annexes 5 p. (unpublished)
- [20] Craig D. Rubin, M.D. “Prevention of hip fractures in the elderly” June 16, 1994
- [21] Melton L J, Riggs BL, “Risk factors for injury after a fall” Clin Geriatr Med 1:525-539, 1985
- [22] Tony Ferraro, “The Danger of Loose Clothing” – April 10, 2014 <https://blog.creativesafetysupply.com/dangers-loose-clothing/>

- 
- [23] Naheed Azher , Muhammad Saeed, Samina Kalsoom – “ Adaptive Clothing for females with arthritis impairment” , JUMDC Vol. 3, Issue 2, Jul- Dec 2012
- [24] [www.Izadaptive.com](http://www.Izadaptive.com)
- [25]<https://tse1.mm.bing.net/th?id=OIP.xOT7L-d27O1rQQ5GpT25jgHaHe&pid=15.1&P=0&w=300&h=300>
- [26][http://www.universaldesignstyle.com/wp-content/uploads/2012/02/IZ-Jacket-TechnicalLRG\\_r1\\_c2-707x1024.jpg](http://www.universaldesignstyle.com/wp-content/uploads/2012/02/IZ-Jacket-TechnicalLRG_r1_c2-707x1024.jpg)
- [27]<https://i.pinimg.com/236x/8c/8e/24/8c8e2464c2b7f052f11d282b71c4a865.jpg>
- [28][https://encryptedtbn0.gstatic.com/images?q=tbn:ANd9GcSUgRWbQUynF3p7Tk8QIsn6QJY8OXEFsqHzcyR5eA\\_qN71cwxg9](https://encryptedtbn0.gstatic.com/images?q=tbn:ANd9GcSUgRWbQUynF3p7Tk8QIsn6QJY8OXEFsqHzcyR5eA_qN71cwxg9)
- [29]<https://i.pinimg.com/564x/3d/6b/ca/3d6bca7f664d8a1403c816d3c5718c90.jpg>
- [30]<https://i.pinimg.com/564x/ce/77/a4/ce77a4eeacba26884e41ae496de8f1e4.jpg>
- [31]<https://i.pinimg.com/564x/27/b1/93/27b1933891774de4c36d0bea33e7b82e.jpg>
- [32]<https://www.pinterest.dk/pin/57983913927170306/>
- [33]<https://www.pinterest.dk/pin/570198002791841044/>