

Adaptive Clothing Designs for the Individuals with Special Needs

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지체 장애인을 위한 개호복 디자인

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(2007. 4. 13. 접수)

Abstract

Nowadays the numbers of the disabled and elderly have been increasing, and the development of adaptive clothing for these people is in demand. The purpose of this study was to give ideas and solutions for the special needs clothing design. The knowledge of medical situation of the individuals with special needs has been examined and factors affecting adaptive clothing were suggested. Twenty-one web sites were investigated and the most practical, functional, fashionable adaptive clothes were suggested by items. Construction and location of openings, number and type of fastenings, and design of garments for comfort and ease of movement were carefully considered in these clothes. Better appearance through improvement of clothing will help these people to believe that they have worth in the sight of others and in their own view of themselves. Disabled and elderly can obtain the quality of life, maintain the dignity, and make the access to the world a little bit easier by solving the particular clothing problems with all these convenient as well fashionable adaptive clothing.

Key words: Adaptive clothing, The disabled, The elderly; 개호복, 장애인, 노인

I. Introduction

Clothing is one of the essential needs of all people and is a subject of universal interest. Expressing themselves with clothing is the right that everybody has. Most people have very little difficulty in purchasing attractive, fashionable clothing in standard sizes that satisfy their personal and social needs, but for those who are physically handicapped, or elderly, the problem of satisfying their clothing needs may be very difficult or impossible(Hoffman, 1979).

Nowadays, the numbers of the disabled and elderly have been increased because of the growing accidents or disease and the lengthening span of life. As long as individuals with special needs take their places in society and work among other people, they must have clothing that is functional and attractive to meet their special needs.

Beginning in the late nineteenth century, psychologists, sociologists, and anthropologists engaged in study of the social significance of clothing. As the members of the medical profession and the social scientists became more interested in the needs of these minority groups in the 1940s when large numbers of disabled veterans were returning to the United States. Occupational therapists, physical ther-

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This work was supported by a research grant from Seoul Women's University(2007).

apists, apparel designers, and home economists have applied their knowledge of design, construction, and the social significance of clothing needs of people, particularly the physically handicapped and the aged under the terms of human values, human needs, human relationships, and human rights(Hoffman, 1979).

The purpose of this research was to develop the special needs clothing design combining fashion and function. This can offer an advice not only to the individuals with special needs but also to the designers interested in creating special needs clothing. I attempted 1) to analyze what kind of difficulties lie which confront the physically disabled who are incapable of executing normal dressing movements, 2) to suggest factors affecting adaptive clothing, 3) to investigate the adaptive clothing in nowadays specialty clothing market through the web sites, 4) to suggest ideas developing adaptive clothing in the future. For this purpose, a literature review was applied and research for the products in the adaptive clothing market was done.

Once better-planned, more fashionable and convenient clothes were produced, people with special needs could be more independent and save time, effort and energy for other activities. They can also lift their self-confidence and self-esteem with the garments which is convenient as well as fashionable.

II. Disability and Clothing Problems

Clothing problems arise from a medical situation, and knowledge of this helps to approach clothing designs for the disabled. In this chapter, I looked over the classification of disability based on 「the law on the welfare of the disabled」, and analyzed what kind of difficulties lie which confront the physically disabled who are incapable of executing normal dressing movements.

1. Classification of Disability

The Disability Discrimination Act(DDA, 1975) by UN defines a disabled person as someone who has a physical or mental impairment that has a substantial and long-term adverse effect on his or her ability to

carry out normal day-to-day activities.

The following distinction is made by the World Health Organization(WHO, 1980), in the context of health experience, between impairment, disability and handicap: “Impairment: Any loss or abnormality of psychological, physiological, or anatomical structure or function. “Disability: Any restriction or lack of ability to perform an activity in the manner or within the range considered normal for a human being. “Handicap: A disadvantage for a given individual, resulting from an impairment or disability, limits or prevents the fulfillment of a role that is normal, depending on age, sex, social and cultural factors, for that individual.”

Handicap is therefore a function of the relationship between disabled persons and their environment. It occurs when they encounter cultural, physical or social barriers which prevent their access to the various systems of society that are available to other citizens. Thus, handicap is the loss or limitation of opportunities to take part in the life of the community on an equal level with others(<http://www.un.org/esa/socdev/enable/rights/ahcstata3refdispecific.htm>).

Following is the classification of disability based on 「the law on the welfare of the disabled」 by the Ministry of Health and Welfare of Korea(Fig. 1). The adaptive clothing is mainly related with people who have body & limbs or brain injury since rest of other physical injuries do not affect the movement much which create clothing problems.

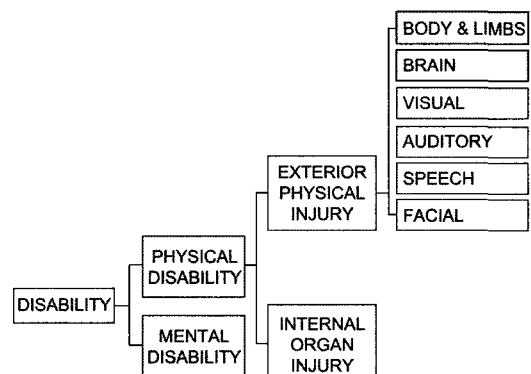


Fig. 1. Classification of disability based on the 「Law on the welfare of the disabled」.

Table 1. Disability and the problems in clothing

Disability	Characteristics	Problems in Clothing
Body & Limbs	Ampitees	Lower limb amputations from the accident or illness Disfigurement is always visible, and this can have varying psychological effects on the individual
	Arthritis	Chronic inflammatory disease of the joints which limits movement Have difficulty in getting dressed & undressed Fastenings on shoes and stockings cause difficulty Need to be kept warm Shape problems can arise
	Spinal Injuries	The damage in the spinal cord Unable to dress by themselves Need to be kept warm Non-absorbent, synthetic fibers must be avoided Seams must be carefully positioned to avoid pressure sores
	Spina Bifida	In wheelchairs or using support Wear pads or bags because of incontinence Fastenings may cause a problem for some people Need to be kept warm Safety is a primary requirement for clothing Difficulties in shape and proportion Easy access needed for incontinence pads and appliances
	Scoliosis & Kyphosis	Scoliosis is sideway curvature of the spine Kyphosis is a hump back Need to be kept warm Fit garment to a brace rather than to a person Detract the eye away from the appliance because the main clothing problem is to get garments to hang correctly Wear and tear problems
	Dwarfing Disease	Abnormally reduced size from a disorder of the pituitary gland and a lack of growth hormone Figure can be small but in proportion or have short arms and legs in relation to body size Have difficulty in finding clothing to suit their age Need to have their garments made to measure
Brain	Cerebral Palsy	Paralysis from partial damage of brain which controls the muscles Unable to dress by themselves Shape problems can arise from the rigid limbs of the spastic and the floppy posture of the athetoid
	Strokes	Partial, one-sided, or complete paralysis from the interruption of the blood supply to the brain Dressing is a slow and frustrating process Fastenings cause difficulty Fabric should be easy to care for to assist independence

2. Clothing Problems

Disabilities affect people in so many ways and to such different degrees. Knowledge about the cause of disability, physical characteristics, and problems in a daily life can help us to approach clothing designs for the disabled. It can also provide some ideas for the garments which meet all the needs of these individuals. <Table 1> shows the characteristics of disability and problems relating to clothing(Thornton, 1990).

The range of problems to consider when designing and making clothes for the disabled is quite considerable. It has to cover shape, size and proportion, amputation, restricted movement, loss of manipulative

skills, excessive cold and heat, wear and tear of garments by appliances or by means of transportation, incontinence, safety, and accessibility to appliances(Thornton, 1990). Having looked at various disabilities and the many clothing problems, we must now find solutions to these problems.

III. Adaptive Clothing

1. Factors affecting Adaptive Clothing

There are several essentials that adaptive clothing has to have. Schematic representation of the factors affecting adaptive clothing is as follows(Fig. 2). Socio-psychological, aesthetic, management, economics,

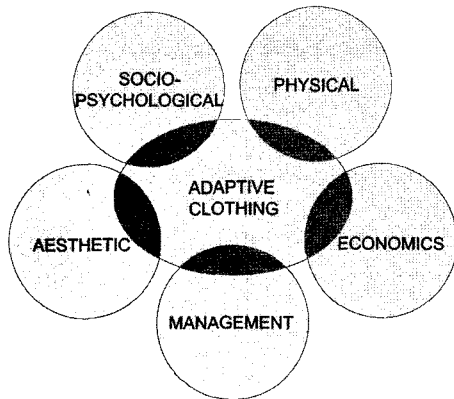


Fig. 2. Factors affecting adaptive clothing.

physical aspects should be considered in the adaptive clothing for individuals with special needs.

1) Socio-psychological Aspect

In socio-psychological aspect, looking good, feeling good, and having the right clothes that promote the independence in dressing can increase self confidence and self-esteem in look. In other words, adaptive clothing can provide an immense socio-psycho-logical boost among the individuals with special needs.

2) Aesthetic Aspect

People with special needs face the inconvenience of shopping for clothes. The majority of those consumers experienced major problems in finding fashionable clothes that fit their disabilities. In aesthetic aspect, all clothes should be attractive and fashionable showing off the wearer's good points and conceal the disablement. For a fashionable look, changes in the adaptive clothing should be invisible when the garment is worn(Kennedy, 1981).

3) Management Aspect

Disabled people need to consider the extra wear and tear on clothing because they get far more wear and tear and washing than do garments made for the able-bodied. Wheelchair arms, or the joints of appliances can cause heavy wear at particular points. It is wise to make sure that garments are made of strong enough material at particular points. A major difficulty can be that tough fabrics produce bulky seams

which may damage sensitive skins or cause pressure sores. In this case, clever design of the garment with careful positioning of the seams is needed to reduce the problem(Thorton, 1990).

4) Economic Aspect

In economical aspect, products at affordable prices are in great concern of adaptive clothing since most of people with special needs have lower incomes and higher cost. Give consideration to the purchase price of a garment and the cost per wearing. And it is wise to select items which can be matched to several units to extend the wear life of a garment and reduce the cost of each wearing(Kennedy, 1981).

5) Physical Aspect

For the individuals with special needs comfort and easy access must be considered. Clothing must be convenient to put on and take off, with good long openings and the minimum of fastenings. It makes the task of getting dressed easier and less painful and frustrating by utilizing unique features, such as velcro closures or snaps.

Protection is needed for those who have little or no control of mouth muscles and tend to dribble, otherwise their upper clothing will be constantly wet, which often leads to chest infections. Delicate skin needs protection from rubbing or pressure caused by rough seams or bulky fastenings.

By considering physical aspects, adaptive clothing can promote independence of the people with special needs in dressing and also provide ease in the dressing process for the caregiver.


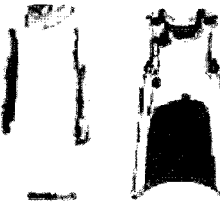
2. Adaptive Clothing in Current Apparel Market

There are numbers of web sites that are sources for special needs or adaptive clothing. The following web sites were on the list under the key word 'adaptive clothing'(Table 2). After investigation of clothing and products available in 21 web sites, the most practical, functional, fashionable adaptive clothing were suggested by items.

Table 2. Web sites of adaptive clothing

<p>www.ableapparel.com www.adaptiveclothingshowroom.com www.buckandbuck.com www.careapparel.com www.easyaccessclothing.com www.myeasydoesit.com www.epiphanydesign.ca www.gramssunshines.com http://innovativeplums.com www.liftvest.com www.minimiracles.ca</p>	<p>www.mjdesignsinc.com www.personalcarewear.com www.professionalfit.com www.shop-onthenet.com www.simplantex.co.uk www.silverts.com www.speciallyforyou.net www.spec-1.com www.wheelchairjeans.com www.wardrobewagon.com</p>
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1) Foundation garment**Table 3. Design & features of foundation garment**

Design	Features
	<ul style="list-style-type: none"> • Front Closing Bra(www.silverts.com) Front velcro fasteners Large finger loops for easy grasping to facilitate dressing Help people with dexterity limitations
	<ul style="list-style-type: none"> • Open Back Slip(www.silverts.com) Full back overlap with snaps at each shoulder Cut-away at back Can be slipped on in a seated position Offer easy access for sanitary considerations. Help people who are disabled or wheelchair dependent

2) Shirt, blouse & Vest**Table 4. Design & features of shirt & blouse**

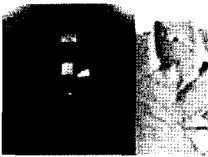






Design	Features
	<ul style="list-style-type: none"> • Velcro Front Shirts(www.professionalfit.com) Velcro tabs behind the placket Decorative buttons in the front Help people who have difficulty in buttoning
	<ul style="list-style-type: none"> • Open Back Blouse(www.silverts.com) Full back overlap with double snaps at shoulders and neck Decorative buttons in the front Allow the individuals arms to be slid into the sleeves without raising/lowering arms or struggling with small neck openings Help people who suffer from arthritis or wheelchair dependent
	<ul style="list-style-type: none"> • Snap Back Shirt(www.buckandbuck.com) Snaps on the back Help people who have limited range of motion

Table 4. Continued

Design	Features
	<ul style="list-style-type: none"> • Clothing Protector T-shirt(www.professionalfit.com) Terry cloth lining Snaps on the back
	<ul style="list-style-type: none"> • Clothing Protector Shirt(www.professionalfit.com) Waterproof lining Decorative buttons in the front Velcro fastening on the back
	<ul style="list-style-type: none"> • Cut Out Back Shirt(www.professionalfit.com) Cut out the back of shirt completely to aid in dressing Help people who are disabled or wheelchair dependent
	<ul style="list-style-type: none"> • Clothing Protector Vest(www.professionalfit.com) Waterproof lining Velcro fastening on the back Dressier alternative to the standard bib

3) *Pants & Skirt*

Table 5. Design & features of pants & skirt




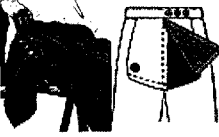
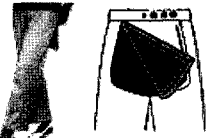




Design	Features
	<ul style="list-style-type: none"> • Hi-Waist Pants(www.professionalfit.com) Full elastic waist Cut higher in the back Flat seams and a roomier seat Help people in a wheelchair
	<ul style="list-style-type: none"> • Out-seam Opening Pants(www.professionalfit.com) Snap from the waist to the ankle Help people with broomstick plaster
	<ul style="list-style-type: none"> • Velcro Opening Pants(www.buckandbuck.com) Velcro opening fly Help people who have difficulties operating zipper
	<ul style="list-style-type: none"> • Open Back Pants(www.silverts.com) Full elastic waist Two overlapping back panels that close in the middle Snap closures at the back waist for easy seated dressing Help people who is immobile or incontinent

Table 5. Continued

Design	Features
	<ul style="list-style-type: none"> • Open Back Pants(www.silverts.com) One large overlap flap at back Snap closures at the back waist for easy seated dressing Help people who is immobile or incontinent
	<ul style="list-style-type: none"> • Side Opening Pants(www.silverts.com) Both sides opening with easy adjustable velcro fastening The front fold-down panel provides slip-on ease for seated position Help people with arthritis or wheelchair dependent
	<ul style="list-style-type: none"> • Wrap Skirt(www.silverts.com) Waist band with easily adjustable Velcro fastening Great for seated dressing Help people with arthritis or wheelchair dependent


4) Dress

Table 6. Design & features of dress

Design	Features
	<ul style="list-style-type: none"> • Full Open Back Dress(www.silverts.com) Back overlap for easy seated dressing Snap closures Help people who is immobile or wheelchair dependent
	<ul style="list-style-type: none"> • Half Open Back Dress(www.silverts.com) Overlap from the back yoke seam Help people who is immobile or wheelchair dependent



5) Outerwear

Table 7. Design & features of outerwear

Design	Features
	<ul style="list-style-type: none"> • Wheelchair Cape(www.silverts.com) Zipper in the front/ Shorter back Provide warmth and comfort Attached hood to keep out the rain Help wheelchair dependent

6) Accessories

Table 8. Design & features of accessories

Design	Features
	<ul style="list-style-type: none"> • Zip-up Tie(www.professionalfit.com) Easy to put on & off Can be adjusted to fit any neck size perfectly Help people who have difficulties wearing Ties
	<ul style="list-style-type: none"> • Clothing Protector Bandana(www.professionalfit.com) Terry cloth lining Snaps on the back Help people who suffer from dribbling

IV. Conclusions

Changes and limitations that occur in physical body are more pronounced for the people with special needs, and they have great difficulty finding garments that fit correctly, hang properly, and being dressed easily. The feeling of self-confidence, the sense of well-being and of social acceptance that comes from the wearing of clothing that is functional, appropriate, and attractive, is important to all people, but to those with special needs, it is much more important.

Adaptive clothing is needed for the disabled with body & limbs or brain injury and elderly who are incapable of executing normal dressing movements. Nowadays, the numbers of the disabled and elderly have been increased because of the growing accidents or disease and the lengthening span of life.

The purpose of this study was to offer ideas and solutions for the special needs clothing design combining fashion and function. To provide the right clothing for the people with special needs, the examination of their medical situation has been preceded since the clothing problems arise from a medical situation, and the knowledge of these can help to approach to the clothing designs for the disabled.

Socio-psychological, aesthetic, management, economics, physical aspects must be considered in adaptive clothing; In socio-psychological aspect, adaptive clothing can provide immense socio-psychological boost among the individuals with special needs. In aesthetic aspect, it should be attractive and fashionable showing off the wearer's good points and conceal the disablement. In management aspect, wear and tear problem should be solved with careful positioning of the seams reducing pressure sores out of tough fabric. In economical aspect, it should be within the reasonable price range so that individuals with special needs can afford. In physical aspect, comfort and easy access must be considered to get dressed easier and less painful and frustrating.

21 web sites were investigated and the most practical, functional, fashionable adaptive clothing were suggested by items. Among foundation garments, front closing bra with velcro fastening and large fin-

ger loops was introduced since most of people with special needs have problems reaching to the back to fasten a bra and manipulating small hooks and eyes independently. Open back slip with full back overlap and cut-away back could offer easy access for sanitary considerations of wheelchair dependent. In shirt, blouse, and vest, velcro or snaps were replaced by buttons to solve the manipulating problems. Open back blouse and cut out back shirt which fasten down the back allowed the individuals to dress without raising/lowering arms or struggling with small neck openings. T-shirt or vest type clothing protector with lining could be also useful as an alternative to the standard bib. In pants and skirt, hi-waist pants with higher back, flat seams, and a roomier seat could help wheelchair dependent. Out-seam opening pants with snaps from the waist to the ankle were designed to accommodate a broomstick plaster. Pants with velcro opening fly could help people who have difficulties in operating zipper. Open back pants with one large overlap flap or two overlapping back panels could allow easy seated dressing and help people who are immobile or incontinent. Side opening pants with the front fold-down panel could provide slip-on ease from a seated position and help people with arthritis or wheelchair dependent. Wrap skirt with easily adjustable velcro fastening could be great for seated dressing and help people with arthritis or wheelchair dependent. In dress, full open back or half open back from the back yoke seam could help dressing of people who is immobile or wheelchair dependent. In outwear, wheelchair cape with hood, front zipper, and shorter back could provide warmth and comfort to the wheelchair dependent. In accessories, zip-up ties could help people who have difficulties wearing ties and clothing protector bandana with lining could be used instead of bibs.

The numbers of the disabled and elderly have been increasing nowadays, and the development of adaptive clothing is desperately in demand. Better appearance through improvement of clothing will help these people to believe that they have worth in the sight of others and in their own view of themselves. Disabled and elderly can obtain the quality of life, maintain the dignity, and make the access to the

world a little bit easier by solving the particular clothing problems with all these convenient as well fashionable adaptive clothing. In other words, well designed and constructed adaptive clothing for individuals with special needs should be kept studying and developing as an ongoing project with careful attention to differing shapes, manipulative skills, and degrees of mobility.

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요 약

재해로 인한 후천적인 장애인과 고령화로 인한 노인의 수가 증가하고 있는 현 상황에서, 이들이 가지는 신체적인 제약을 보완할 수 있는 개호복의 개발이 요구되고 있는 실정이다. 본 연구는 지체 장애인의 의상 디자인을 위한 아이디어나 해결책을 제공하여 패션과 기능이 접목된 의상 개발에 도움이 되고자 한다. 이를 위해 먼저 장애로 인한 신체적인 특성 및 의상착용에서의 문제점 등을 조사하고, 이를 보완할 수 있는 개호복 디자인에서 고려해야 할 필수 요소들을 살펴보았다. 장애인이나 노인을 위한 의상을 취급하는 21개의 웹사이트를 선정하여 조사하고, 실용적이고 기능적이며 미적인 의상들을 품목별로 제시하였다. 그 결과, 이러한 의복에서는 오프닝의 구성 및 위치, 단추·지퍼·벨크로 등과 같은 여밈의 종류와 수, 움직임의 편안함과 연결된 디자인 개발이 주의깊게 고려되었음을 알 수 있었다. 이와 같이 신체적인 제약을 보완할 수 디자인의 연구와 개발은, 장애인 개개인이 자신에 대한 소중함을 깨닫고 의기소침함에서 벗어난 긍정적인 사고를 갖게 하고 숨어있는 능력을 발휘할 수 있게 하는 사회적 재활의 한 측면으로 중요한 의미가 있으므로 꾸준히 지속되어야 한다고 사료된다.