

Functional Female Clothing Design with Physical Disabilities in Bangladesh

Darima Fairouz Shorna¹, Md.Meraj Taj², Alvy Al Srijon³

¹Lecturer, National Institute of Textile Engineering & Research

²Senior Fashion Designer, Zandrotex Fashion gmbh

³Senior Lecturer, BRAC University

ABSTRACT: While looking into garments for individuals with incapacities has been a zone of enthusiasm for decades among apparel researchers, there is limited data about people with disabilities. The reason for this examination is to distinguish the possible garments needs of females with inabilities and a sequence of modifications will be established based on summary results. The Functional, Expressive and Aesthetic (FEA) Model will be utilized as the calculated system to distinguish the requirements. Organizations and individuals are known to aid people with impairments by conducting a physical survey. Forty-one young ladies with incapacities reacted to the survey about their attire intrigue, issues and needs. While graphical insights will be used to examine the quantitative data, another application of the FEA model will be used to code the subjective information and identify study responses' concerns. The primary dress issues were identified with fit, styling, donning and doffing, and trouble utilizing clasp. A floral theme on Nakshikatha will be utilized for design. Presently the body-garment relationship falls within the model's fashionable considerations, Catharanthus roseus, an evergreen sub-herb jeopardized plant motif can be woven or sewn into the costumes as an attractive component of dresses. According to the survey results that were thoroughly documented by the participants, it is proposed in this inquiry that the body-piece of clothing relationship does not have a place with a solitary thought type, but it is a combination of functional, expressive, and aesthetic reflection. The final collection will be adorned depending on adaptive people's environmental and social circumstances.

KEYWORDS: Adaptive Clothing, FEA Model, Survey, New functional design, Catharanthus roseus.

INTRODUCTION

There are an estimated 16 million individuals with disabilities in Bangladesh, accounting for about 10 percent of the country's population. In 2004, the prevalence of disability was approximately 6 percent among those under the age of 18, and around 14 percent among adults. While individuals with disabilities are entitled to government support, such programs have been limited in scope and primarily focused on urban areas. Moreover, disability issues have not been fully integrated into mainstream development initiatives. In response, non-governmental organizations (NGOs), such as the Center for Disability in Development (CDD), have taken steps to provide assistance and promote inclusion for people with disabilities across the country.

Many Bangladeshis still hold negative perceptions of disability. In rural areas in particular, disability is often viewed as a curse and is sometimes mistakenly believed to be contagious. These misconceptions contribute to social stigma and exclusion. As a result, children with and without disabilities rarely form friendships, leading to social divisions that often persist into adulthood.

Bangladesh is involved with the United Nations Convention on the Rights of Persons with Disability (CRPD), having marked the arrangement on 9 May 2007 and sanctioned it not long after on 30 November 2007. On 9 October 2013, Bangladesh passed a bill called the Personswith Disabilities Rights and Protection Act 2013, which executed its commitments under the CRPD. This law supplanted the Disabled Welfare Act 2001.

With several key national planning documents underway in Bangladesh—including the Poverty Reduction Strategy Paper (PRSP), sectoral programs, and a national action plan—it is a timely opportunity to assess the situation and needs related to disability. There is a strong, cyclical relationship between disability and poverty: poverty can lead to disability, and disability can deepen poverty. People with disabilities are often among the poorest in society. According to the World Bank, individuals with disabilities comprise an estimated 15 to 20 percent of the poor in developing countries.

In Bangladesh, the disabled community suffers a variety of clothing issues. Garments may be seen as a minor environmental issue among many people with disabilities (Newton, 1984). Following the passage of the Americans with Disabilities Act in 1990, more

Functional Female Clothing Design with Physical Disabilities in Bangladesh

participation in the workplace and network has resulted in extra requirements for suitable clothing for people with disabilities. (Carroll and Kincade, 2007).

Female grown-ups and understudies with disabilities have been the primary focus for this particular demographic. While specially designed clothing may offer certain advantages for people with disabilities, they may also promote self-stigmatization. The demands of middle-aged people with disabilities also enable them to feel like they fit in with their partners and friends, minimizing the shame they may feel on a regular basis. As a result, the purpose of this study analyzes the pragmatic clothing structure demands of females with disabilities.

This study was conducted in Bangladesh to explore the clothing preferences and needs of individuals with disabilities. Participants responded to a set of 19–20 questions designed to gather detailed insights. Following the data collection phase, thorough analysis and statistical evaluations were carried out to identify key concerns and clothing-related requirements. Based on the findings, a traditional design concept was selected as an inspirational foundation for developing practical and meaningful clothing solutions for individuals with disabilities—aiming to promote both functionality and a strong sense of positive identity.

I. RESEARCH METHODOLOGY

This study focused on evaluating the clothing needs of females with disabilities. The following sections detail the research process, including the survey methodology, data collection procedures, data analysis techniques, statistical methods, discussion of findings, and the results of the analysis.

A. Survey method

The questions were developed to assess satisfaction with apparel. The six key areas of focus would be style, fit, comfort, safety, and the ability to dress and undress. A short open-ended component of the survey was utilized to examine previous garment issues. A needs assessment questionnaire was utilized to assess the needs and preferences of women with disabilities. There were 19/20 questions to answer, including handicap categories and tasks they could/couldn't accomplish on their own. Respondents were also provided with a list of common garment features and asked to rate each one based on how well it met their needs and abilities.

B. Data Collection

The participants were physically reached. There are various disabled people's schools and rehabilitation centers in Bangladesh. Because the number of responses from participants contacted physically was deemed insufficient, hospitals, rehabilitation institutions, schools, independent living centers, and other organizations serving people with disabilities across the country were contacted in an effort to recruit more participants for the study. Nishpap Autism Foundation, Proyash, School for Special Care, and Autism Rehab Centre received questionnaires. A total of 100 disabled people were questioned, with 41 responding. The questions were developed to assess respondents' satisfaction and functionality with clothing based on their disability type. After the desired number of participants completed the survey, responses were collected and analyzed.

C. Statistical Analysis

For the statistical analysis, SPSS (Statistical Package for the Social Sciences) software was utilized. Descriptive statistics were employed to conduct an in-depth examination of the data. This included methods such as frequency distributions, cross-tabulations, and descriptive ratio statistics to identify patterns, relationships, and key trends in the responses.

II. RESULT OF DISCUSSION

The study participants were female individuals between the ages of 16 and 30, each living with one of the following disabilities: one-sided paralysis (hemiplegia), arthritis (affecting the arms or legs), club hand, visual impairment, or recovery from arm surgery. Assistance during the survey process was provided by six caregivers, approximately three medical doctors, and several other support personnel. Demographic information collected included age, city of residence, religion, and marital status. Participants were also asked to report their specific type of disability, the use of any assistive mobility devices, and the frequency with which these devices were used. The purposive sample included respondents aged 16 to 35, with 78 percent falling within the 16 to 25 age range, as shown in Table 1.

TABLE I AGE RANGE OF PARTICIPANTS

Age	Case	Percentage
16-20	16	39.0

Functional Female Clothing Design with Physical Disabilities in Bangladesh

21-25	16	39.0
26-30	6	14.6
31-35	3	7.3
Total	41	100.0

In the Survey, participants were asked to answer about their living area. About 18 different cities were mentioned as their living city in Bangladesh including Dhaka, Chittagong, Barishal, Bogra, Chadpur, etc.

A. Participants Religion & Marital Status

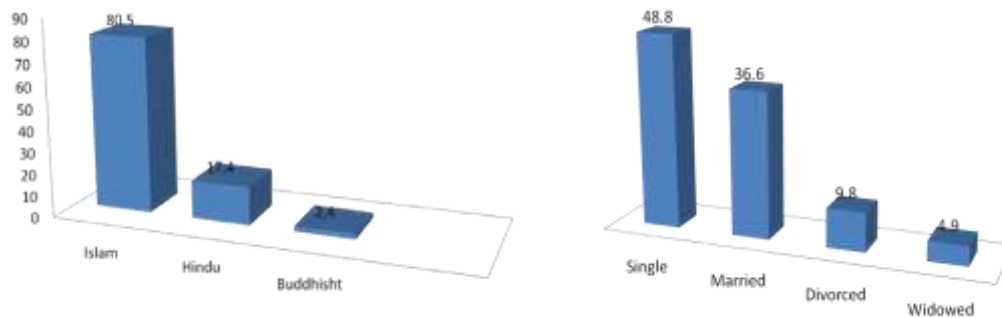


Figure 1 Religion & Marital Status

Figure 1 shows that 80.5(n=33) percent of individuals were Muslim, 17.1(n=7) percent were Hindu, and just 2.4(n=1) percent were Buddhist. Figure 1 also depicts the marital status of disabled participants. The primary target group was females aged 16 to 25, most of whom were single. In total, 20 participants (48.8%) were single. About 36.6% of the participants were married, primarily within the 26 to 35 age group, totaling 15 married women. Among the 41 participants, four were divorced (ages 24 and 30) and two were widowed.

A. TYPES OF PATIENTS DISABILITY

TABLE II TYPES OF DISABLED PATIENTS

Types of Disability	Case	Percentage
Visual impairment	7	17.1%
Hemiplegia	11	26.8%
Arthritis	14	34.1%
Arm surgery	5	12.2%
Club hand	4	9.8%
Total		100.0%

Twenty-three participants described their types of disabilities, dressing abilities, and the impact of assistive devices on their clothing needs (see Table II and Figure 2). The study categorized disabilities into five types: visual impairment, hemiplegia, arthritis, arm surgery, and club hand. For instance, seven women reported visual impairment, eleven reported hemiplegia or paralysis, and fourteen reported arthritis, which included restricted arm and leg movement, as well as arm surgery affecting primarily the right arm, resulting in limited mobility.

Among these, some women were born with club hand or a deformed hand. Regarding assistive device usage, the majority of participants who used such devices reported using them five to seven days per week, indicating that these tools are integral to their daily lives and must be considered by clothing designers. While most participants did not require assistive devices for daily activities, individuals with hemiplegia typically depended on wheelchairs to assist with mobility and daily living tasks.

Functional Female Clothing Design with Physical Disabilities in Bangladesh

B. IMPACT PERCENTAGE OF ASSISTIVE MOBILITY TOOL

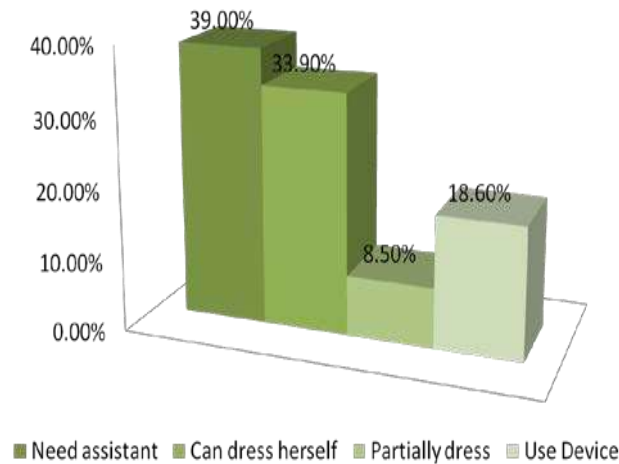


Figure 2 Assistive Mobility tool for Daily Work

Figure 2 illustrates that 18.6% of participants reported that assistive devices impact their daily lives, with approximately 11 individuals indicating they require assistance while dressing. Some arthritis patients occasionally use a cane for walking, though this varies among individuals. A few female participants require help with dressing, even though they are generally able to dress independently. Participants with visual impairment, hemiplegia, and club hand often need the support of an assistant or nurse during dressing.

Those with arthritis are generally able to dress themselves, while patients recovering from arm surgery can dress partially but may occasionally need help with fasteners. Overall, Figure 2 shows that 39.0% of participants require assistance when dressing, 33.9% are able to dress independently, and 8.5% can only dress partially.

C. ACTIVITY DIFFICULTY

TABLE III DIFFICULTIES WHILE DOING ACTIVITIES BY PARTICIPANTS

Mobility	Case	Percentage
Stay in one position	6	17.2%
Change position	4	13.8%
Lift/Carry/Move	5	17.2%
Hand and arm use	2	6.9%
Walk	13	44.8%
Total		100.0%

Participants were asked to talk about their impairment issues while undertaking various tasks in their daily lives in this section. For a simpler understanding, this questionnaire was separated into four levels and three groups. The first layer deals with mobility issues, the second with self-care, the third with household life, and the final with interpersonal behaviors. Staying in one body posture, shifting position difficulty, lifting/carrying/moving difficulty, hand or arm usage difficulty, and walking difficulty are all included in the mobility portion.

1. (*Stay in One Body Position, Activity Limitation, Severity of Disability*): Table III indicates that Sayma Binte (participant 3), Amina Anowar (7), Sonia Aziz (9), Fahmida (17), Papiya Puja (19), and Farida Parvin (32) experienced no difficulty maintaining a single body posture. Among them, participant 3 had hemiplegia; participant 7 had arthritis; participant 19 had undergone arm surgery; participants 9 and 18 had club hands; and participant 32 had blindness or visual impairment. Except for participant 3, none required assistance with minor movements or sustaining one position for an extended period. In contrast, participant 3 faced severe challenges and needed help with all routine activities.

TABLE IV ACTIVITY LIMITATIONS OF DISABLED PATIENTS

Activity Limitation	Case	Percentage
No difficulty	8	11.3%
Mild	12	16.9%
Moderate	15	21.1%
Severe	17	23.9%
Unable to carry out	19	26.8%
Total		100.0%

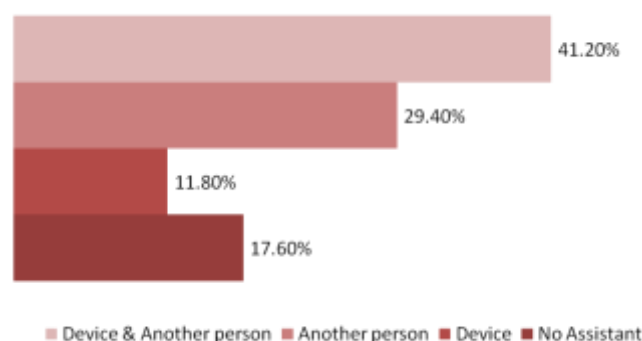


Figure 3 Severity of Disability

This question will also define the activity restrictions issues on a four-point scale (0=No difficulty, 1=Mild difficulty, 2=Moderate, 3=Severe, 4=Unable to perform) (table IV). The numerical values of the responses were combined together to calculate the score indicating disability activity difficulty and clothing problem and Figure 3 will discuss disability severity. It reflects the severity of impairment on a four-point scale (0=No help, 1=Help from an assistive device, 2=Help from another person, 3=Help from an assistive device and another person).

2. *(Changing Body Position, Activity Limitation, Severity of Disability)*: Four participants—Hasina Begum (1), Jahanara Anowar (5), Debjani Ray (20), and Nurin (41)—reported difficulties with changing body positions. In the activity limitation scoring (Tables III and IV), participants 1 and 41 indicated a score of 1, representing mild difficulty; however, they did not require assistance from a caregiver to change positions (see Figure 3). Participants 5 and 20 reported moderate difficulty, corresponding to a score of 2 on the scale (Table IV).
3. *(Lifting/Carrying/Moving, Activity Limitation, Severity of Disability)*: According to Table IV, five participants—Nurjahan (8), Afsana Haque (13), Munira Khatun (14), Moyna (15), and Papiya Puja (19)—reported difficulties with lifting, carrying, or physically moving objects. Their disabilities include club hand, visual impairment, arthritis, hemiplegia, and arm surgery, respectively. Participants 8 and 13 rated their activity limitation as 1 (mild difficulty) with a severity score of 0. Participant 14 reported moderate difficulty (score of 2) with a severity score of 1. For participants 19 and 15, the severity scores were higher, at 2 and 3, respectively, indicating greater challenges in these activities.
4. *(Hand and arm use, Activity Limitation, Severity of Disability)*: In hand and arm mobility Zubinara(11) and Fahmida(17) chose activity limitation score 3=Severe and 4=Unable to carry out as they are suffering from one side paralysis and deformed hand problem (Table 4). Their severity score is 1.
5. *(Walking)*: Around 10 (3,4,11,12,15,24,27,31,33,40) participants score for activity limitation 4=unable to carry out,0=no difficulty for disability patients 8 and 3=Severe for 34 and 23 number patient table IV. The severity scores 1=help from an assistive device for 8 no club hand disabled participants, and 2=help from another person for 34no arm surgery patients. The rest of them were noted as score 3=help from another device and assistive person Figure 3.

Functional Female Clothing Design with Physical Disabilities in Bangladesh

6. *(Dress and undress/Donning doffing)*: Participants 8,17,19,20,34 had minor difficulty with wearing and doffing.1,16,21,26,32,41 These few females, mostly those with eye and hand disabilities, find it mild to less aggressive. Activity Restriction Score 3=Severe for 14, 29, and 30, all of them are incapacitated due to arthritis in their limbs and legs. Score 4 denotes unable to perform for 3,4,11,12,15,24,27,31,33,40. They are primarily ladies with hemiplegia and one-sided paralysis. For impaired people aged 19 and 34, the severity score is one. Score 2 for 1,8,17,16,20,21,26,32,41. They expect everyone else to help them carry their clothes. Score 3 for 11, 12, 14, 15, 24, 27, 29, 30, 31, 33, and 40. They are all hemiplegic or have arthritis. These two groups of impaired persons are the most serious.
7. *Clothing problem*: The ladies completed a five-point Likert scale (1=poor,2=Fair,3=Good,4=Very good 5=Excellent) for assessing clothing interest. The numerical values of responses were added to produce a score indicating the level of clothing problem. The subjects indicated a wide range of dissatisfaction with present clothing characteristics. Using this type of analysis, the lowest possible score was 1 and the best possible score was 5. Despite the short sample size, females reported poor, good, and outstanding degrees of current clothing difficulties. They scored poor in Table V for Comfortable/free mobility of current garment qualities. Around 26 people voted for poor, with 15 voting for appropriately good. 31 members voted for easy on/off clothing, with 30 voting terrible and 11 voting fair.

TABLE V PROBLEMS OF PRESENT CLOTHING

Characteristics of present clothing	Poor 1	Fair 2	Good 3	Very good4	Excellent 5
Comfortable/freedom of movement	26 people	0	15 people	0	0
Easy on, Easy off	30 people	11people		0	0
Stylish	35people		3people	0	0
Easy care fabric,		18people	18people	5people	0
Safety	22people	19people	0	0	0
Fit	32 people	9people	0	0	0
Serviceability	21 people	20 people	0	0	0

Following today's trend, current clothing isn't particularly stylish, which is why just three individuals rated it as excellent and 35 as terrible in terms of style. quality of the material is quite sufficient that's why 18 ladies voted for fair, the other 18 voted for outstanding, and 5 mentioned it became exceptional for its easy-care character. Fit is the most sensitive issue for handicapped ladies. Only nine of 41 people said the current clothes fit was fair, but 32 said it was poor. About 21 handicapped ladies voted negatively on the suitability of current clothing, while others voted fairly.

8. *Fastener Difficulty (Button,Zipper,Hook and Eye)*: About 15 people mentioned that buttons are a cause of their dressing dissatisfaction. They have to face issues throughout wearing on and off the clothes without any assistive tool or assistance. Sometimes the buttonholes are too brief to enter. Only 2 disabled women have bitch with a snap button, rest of them are glad with the working exceptional of this fastener. They cited "It's easy to carry out, but after using for a long term the snap receives automatically lose".35 disabled contributors have trouble with zippers in recent apparel. They stated that "Sometimes the "teeth of the zipper jammed" and occasionally "puller smash down befall". Zipper fastener is very hard for individuals who are suffering from hemiplegia, arthritis and arm surgical treatment. About 33 human beings with a disability complained about the frequent spoiling down of the hooks and eyes. They are very much dissatisfied with this fastener.
9. *Clothing Interest*: Respondents were asked to express their level of satisfaction with the selection of dressing style, fit, comfort, surface work, fabric etc. (Table VI). An open-ended question was used to assess the overall satisfaction.

TABLE VI CLOTHING INTEREST

Features	Case	Percentage
Two-piece	26	12.3%
One-piece	14	6.6%
Full	41	19.3%
Semi fitted waist	15	7.1%
Elastic encased waist	26	12.3%
Pocket	24	11.3%
Patch	17	8.0%
Embroidery	13	6.1%
Print	20	9.4%
Plane	16	7.5%
Total		100.0%

10. *Two-piece outfits*: 12.3% of the participants (n=26) claimed it would be more comfortable for them to wear two pieces of clothing, and they chose it for daily clothing. The outfit might be made up of a shirt or a top and loose pants. Depending on their level of comfort and safety, people with different disabilities choose varied styles. For instance, people with paralysis or hemiplegia like long shirts and loose pants that are simple to unzip and carry. Table VI.

Bangladeshi disabled women expressed disappointment regarding fit 55% expressed disappointment with how the trousers fit. (Table VI) More than half (n=20.5) of the members expressed dissatisfaction with the selection of trousers that are available. Participants noticed that there is a lack of alternatives in stylish pants with adjustable midriffs and they conveyed a desire for such clothing. 63 percent (n=26) of the ladies reported finding it difficult to operate the pant hooks. Patients aged 16 to 22 with disabilities affecting the hand, arm, or vision expressed a preference for semi-fitted garments with elasticized waistbands. As the youngest group, they place importance on maintaining social relationships and desire clothing that is both creative and well-fitting. There is also a notable shortage of fashionable clothing options for young women with disabilities. In this study, 15 younger participants (Table VI) preferred semi-fitted clothing, while 26 favored elasticized waistbands for comfort and flexibility.

To enhance aesthetic appeal and functionality, features such as connected pockets and patches can offer practical benefits for individuals with hand and arm impairments. Many participants prefer to conceal their affected body parts in public, and the inclusion of pockets and patches on ready-to-wear garments provides a discreet way to do so while maintaining a visually appealing appearance. A total of 24 participants voted in favor of pockets, and 17 expressed a need for patches on their clothing.

Most adaptive clothing currently available on the market tends to be plain and colorless. However, many individuals with disabilities desire garments that are decorative and reflect their inner strength and dignity. Since they already face significant challenges, wearing clothing that highlights or emphasizes their physical differences can make daily life even more difficult. Because clothing is a key part of their daily experience, approximately 13 participants expressed a preference for woven patterns or motifs on their garments. They believe such designs would enhance their wardrobe and help them showcase the vibrant, positive aspects of their personalities.

11. *Desirable Clothing Properties*: Since many existing clothing options do not fully meet the needs or preferences of individuals with disabilities, an open-ended question was included to gather their desired clothing qualities. Comfort and ease of wearing were the most frequently mentioned attributes by the participants (see Table VII).

TABLE III PREFERABLE CLOTHING PROPERTIES BY RESPONDENTS

Features	Case	Percentage
Comfortable/Movement	41	16.6%
Easy on/off	41	16.6%
Easy care fabric	29	11.7%
Attractive color	29	11.7%
Long lasting	28	11.3%
Safety	41	16.6%
Loose fit	38	15.4%
Total	247	100%

Young girls have chosen attractive colors for their outfits. Some adults also talked about the longevity of the clothing. But one feature that all young and adults picked is safety. The middle-aged females chose loose fittings as they prefer comfort above any of the other features

12. *Functional Design consideration with Traditional Element and FEAModel:* Unlike fashion-driven attire, which is primarily shaped by the designer’s creative vision, utilitarian clothing begins and ends with the client’s specific needs. These needs—whether related to performance, comfort, or both—are influenced by the wearer’s environment and daily activities. Once the client’s requirements are clearly defined, the next steps involve selecting suitable materials, determining the garment’s construction, choosing an appropriate motif, and integrating this with traditional patterns. Finally, these diverse elements are combined into multilayered or composite designs that effectively address the demands for comfort, protection, and functionality.

III. DISCUSSIONS OF RESEARCH

The purpose of this study is to assess the perceived clothing needs of females with disabilities. The Functional, Expressive, and Aesthetic (FEA) model developed by Lamb and Kallal (1992) was used to investigate the functional, expressive and aesthetic considerations. This model allows designers to think of designing for specific needs as a part of the general design framework. Examples of the functional considerations include fit, mobility, comfort, protection, donning and doffing. Expressive considerations are the values, roles, status and self-esteem of the wearer. Finally, the aesthetic considerations are defined as the art elements, design principles and the body-garment relationship (Lamb & Kallal, 1992). One adaption made to the functional considerations of model was the addition of safety. Safety was considered important relative to assistive mobility devices used by females with disabilities

A. BODY-GARMENT RELATIONSHIP WITH TRADITIONAL ELEMENT AND THE FEA MODEL

According to the FEA Model, the body-piece of clothing relationship is an aesthetic notion of plan. The body-garment interaction extends beyond the look of clothing on the body. The desire for a thinner shirt is an example of the body-piece of clothing connection. Because of the way the clothes appear on the body, it makes the wearer look thinner. This might seem to be a completely fashionable notion, but one must wonder why the wearer needs to appear thinner. To achieve the fundamental goal of having a thinner look, one's choice of clothes at that moment plays an important function in creating this visual illusion. This proves how the body-garment interaction entails more than just feeling.

Another example of this blending of concerns is the problems ‘one woman had regarding her clothing, "Hard to find apparel to accommodate my restricted arm while attempting to cover my shoulder shape and stick"’. The issues of fit, body-piece of clothing relationship, and assistive device relationship are all addressed in this statement. She represents concealing her physical type that does not conform to society’s ideal. She is also attempting to hide her stick, which is not socially acceptable. Her ideal body-article of clothing interaction is driven by an expressive inspiration. The greatest way to build this relationship is through her clothing and the potential use of structural components like shading and line. This shown blending of all three ideas produces a recommended adjustment to the FEA presentation. It is advised that the body-garment interaction incorporate all of the model's practical,

Functional Female Clothing Design with Physical Disabilities in Bangladesh

expressive, and aesthetic aspects rather than just being a fashionable concept. The model would be redesigned to feature a center loop that combines all of the model's elements to demonstrate the integration of all of these pieces to form the body-clothing relationship.

Catharanthus roses woven on the surface of garments will give the wearer a wealthy appearance. Because the flower motif reflects an extraordinarily strong and pure personality. The FEA model's aesthetic and expressive thinking will be covered by the outside beautifying. The global market or fashion show is currently brimming with distinct marked-impaired garments. But there is an absence of functional, expressive and aesthetic look of the present garments. Disabled young females encounter several types of negative experiences while shopping for fashionable functional attire for them, as they, too, have families and must attend parties and events like everyone else. According to one of the members, if the clothes are sufficiently exquisite, they will fail to meet utilitarian qualities. They are unable to obtain the required trendy attire within their budget. The garments in the final collection will be constructed with functionality in mind. The desired fastening, style, and location of closures will be completed according to survey results.

The finished outfit was ready to wear. It has been created using the FEA model and survey list in mind. Since the living expenditures and costs of a disabled person have been discussed in this study, there will be a close eye on the expense and cost of the materials when deciding on specific clothing.

B. DESIGN DISSECTION

There are four designs for the final collection. Make sure the design process undergoes the result of the survey and consideration with functional, expressive and aesthetic considerations.

1. *Design 1:*(Expressive, Functional & Aesthetic Reflection): The medium neckline gives the garment a more relaxed and approachable look, enhancing comfort and ease of wear. Two functional pockets on either side not only serve utility but also suggest a casual, practical style, adding to the garment's expressive functionality. Besides a full front zipper allows for easy donning (putting on) and doffing (taking off), making the garment user-friendly and accessible.



Figure 4 Suggested Design for Club Hand & Arm Surgery Patients

Zippers on both sides of the pants, running from waist to toe, provide flexibility for movement, ease of dressing, and possibly medical or assisted dressing applications. Moreover, the use of an elastic waistband accommodates various body types and ensures comfort, especially as per feedback or requirements from users/respondents. To improve aesthetic appearance, delicate flower motif embroidery around the neck area adds elegance and softness to the overall design, serving as a decorative focal point that enhances the visual appeal.

2. *Design 2 :*(Expressive, Functional & Aesthetic Reflection): The front of the garment extended to toe will have a long, flowing design, perhaps for added style or dramatic effect. This could create a very elegant, elongated silhouette. Bold, vibrant fabrics will be chosen for the garment, making it stand out visually and adding energy to the design. Functionally curved lower back will provide ergonomic support and comfort when sitting, allowing for ease of movement and practicality without compromising style. The inclusion of side zippers ensures that the garment is easy to put on and take off, adding a functional element that enhances convenience and for the aesthetic appearance embellishing the chest area with embroidery adds a personal or artistic touch, making the garment unique and visually appealing. Besides the raglan sleeve style provides a casual and sporty aesthetic while also offering greater freedom of movement in the arms, contributing to both comfort and style.



Figure 5 Suggested Design for Hemiplegic or Paralysis Patients

C. FABRIC SELECTION CONSIDERATIONS FOR INDIVIDUALS WITH DISABILITY

When designing garments for individuals with disabilities, frequent washing is often necessary due to varying care needs. This makes fabric selection critical—not only for durability but also for odor control and comfort. Certain man-made filaments, such as nylon and polyester, are known to retain unpleasant odors, even after multiple washes. This is due to their hydrophobic nature, which can trap oils and bacteria, reducing the garment's freshness and hygiene over time. For better breathability and odor resistance, the use of cellulosic materials is recommended:

Cotton – Soft, breathable, and easy to launder, making it ideal for everyday wear.

Linen – Offers excellent moisture-wicking and cooling properties, suitable for warmer climates.

Wool – Naturally antimicrobial and odor-resistant, great for outerwear or cooler environments.

These fibers not only support hygiene but also contribute to the comfort, dignity, and confidence of the wearer—especially important for those who rely on caregivers for clothing maintenance.

D. INSPIRATION AND EMBELLISHMENT: CATHARANTHUS ROSE (NAYANTARA) MOTIF

The **Catharanthus Rose**, commonly known as **Nayantara** in Bengali, serves as the **central floral inspiration** for the embroidery featured throughout the designed outfit. Renowned for its soft five-petal form and cultural familiarity, this flower has been adapted artistically to suit varying design needs across garments. The design allows for creative flexibility, enabling variations in scale, form, and arrangement while preserving the essence of the flower. The Nayantara-inspired embroidery has been strategically applied to:

Neckline – Adding elegance and a focal point near the face

Shoulder area – Providing balance and subtle decorative detail

Upper half of selected garments – Contributing to a cohesive visual language throughout the collection

This embroidery technique not only adds a textural dimension to the garments but also reflects craftsmanship, cultural identity, and thoughtful detailing.

IV. CONCLUSION

This study focused on a small group of women with a range of impairments to better understand the issues surrounding day-to-day wear. Future studies should increase the sample size to improve the validity of the findings. One drawback of the purposive, self-selecting sample was the low number of participants in the sample group. The participants in this study were discovered to have a mix of diverse handicaps, and those who demonstrated the use of assistive versatile devices. The respondents demonstrated a wide scope of apparel enthusiasm from low to medium to high. The example identified five key dress concerns, which included: apparel that is difficult to put on and take off, inappropriate fit, garment needs to be altered, excessively costly and outmoded style.

Functional Female Clothing Design with Physical Disabilities in Bangladesh

Disappointment with fit and fastening was a common theme across all garment styles. Not only were fit and securing a concern with jeans but the purchase of jeans was deemed unacceptable by half of the participants (n=20.5). Only 48% (n=20) of those members wore skirts. Wearing and doffing of skirts was not seen as improper by those who wore them. Shirts were worn by more than half of the adolescents. 61 percent were dissatisfied with the shirt. They avoided wearing shirts with clasps since they were depicted as challenging to use. Eight percent of the participants said clasp-on shirts were simple to use. The majority of the responses were practical in nature. Several severe concerns were identified, including fit and dress fasteners, movement comfort, ease of on/off, and security. Clasps were also difficult in each sort of garment. Elastic belts, snaps, and Velcro were identified as suitable alternatives to catches and zippers. Another concern was donning and doffing, which was associated with closures. It is hypothesized that the ability to dress and undress without assistance is associated with the independence that young individuals want.

Future study should concentrate on obtaining a representative sample of working young individuals and defining the sort of job in which they are employed. Furthermore, the sample should be enlarged to include males and children. Finally, this study broadens the research on apparel product development for persons with physical limitations by concentrating on an expanding market sector. Additionally, the study extends the adoption of an Inclusive Design approach as a viable strategy behind ready-to-wear clothing design by giving a framework for the garment industry to explore new clothing lines for women with physical limitations.

ACKNOWLEDGEMENT

I would like to express my deepest gratitude to Professor Li Yue for her unwavering enthusiasm, guidance, and mentorship throughout the journey. Her passion for research and commitment to her students has been a continuous source of inspiration during my time at Wuhan Textile University. I have learned so much under her supervision, and I don't think words can fully express my appreciation for the time and dedication she has invested in helping me grow as a student and researcher.

My sincere appreciation also goes to Dr. Bashona Muhuri and her medical clinic for individuals with disabilities, the Nishpap Autism Foundation, as well as other organizations including Proyash, School for Special Care, and Autism Rehab Center. Their support and the cooperation of all participants were invaluable to this study.

I am also grateful to Will, who assisted me throughout the entire survey process. Without his help, completing the survey analysis on time would have been extremely difficult.

Finally, I would like to thank my family for their endless love and support. My parents and sibling are the foundation of my journey toward earning this degree. They have taught me the value of hard work and given me every opportunity to pursue my dreams.

REFERENCES

- 1) ALI, Z., December 2014,. Economic Costs of Disability in Bangladesh. Bangladesh Development Studies, Volume Vol. XXXVII, pp. 18-33.
- 2) Clulow, E. E., 1974. Clothes for the handicapped. s.l.:Journal of the Royal College of General Practitioners, 24, 362.366.
- 3) Gupta, D., December 2011. Functional clothing-Definition and classification. s.l.:Indian Journal of Fibre & Textile Research 36(4):321-326.
- 4) Kabel, Z. A. A., online: 15 Jul 2016. Sensory Design Reviews Disability, the Senses and Apparel: Design Considerations. s.l.:Taylor and Francis Online Pages 206-210 | .
- 5) Katherine Carroll, K. G., 2016. Mexico Document. [Online] Available at: <https://vdocuments.mx/documents/an-examination-of-clothing-issues-and-physical-limitations-in-the-product-development.html?page=1>
- 6) Smith, N. S. M. K. A.-B. L. C. a. B. D. w. L. R., 20th Oct 2004. Disabled people's costs of living, UK: Joseph Rowntree Foundation.
- 7) Laurel Romeo, 12th November, 2015, "Apparel Needs and Expectations Model: A New Paradigm of the Apparel Product Development" Louisiana State University, ldromeo@lsu.edu, Young-A Le, Iowa State University



There is an Open Access article, distributed under the term of the Creative Commons Attribution – Non Commercial 4.0 International (CC BY-NC 4.0)

(<https://creativecommons.org/licenses/by-nc/4.0/>), which permits remixing, adapting and building upon the work for non-commercial use, provided the original work is properly cited.