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Designing of functional garments for patients with limb fractures

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Abstract
Clothing is important because it reflects an individual's culture, personality and preferences. People can use clothing to enhance personal appearance and protect the body from extreme temperatures and elements in various climates. People often form first impressions based on what a person wears. Making sure that private parts of the body are covered is very important for maintaining a decent appearance in public in the majority of world communities. Clothes have always been considered starting from their functional and social role.

Keywords: requirement, problems, fractured patients

Introduction
Although clothing plays a role in identifying differences among individuals in different socioeconomic levels, it serves many practical uses as well. Clothes vary widely in style, pattern, colour and price. They are also made for certain activities, such as formal events, everyday wear, and for sports and outdoor activities such as hiking, running and playing soccer.

Adaptive clothing are easy access clothes for seniors, elderly and disabled. Difficulties getting dressed and undressed are common issues as one ages or suffers from an ailment - joints get stiffer, mobility and range of motion become limited, and managing closures like zippers and buttons can develop into a real challenge. Anyone who experiences any of these challenges will benefit from adaptive clothing. Adaptive apparel makes daily dressing remarkably easier for both the person being dressed and the person dressing them. Adaptive apparel for patients combine comfort, style, affordable pricing and wash ability.

Objectives
1. To identify the different types of fractures in male patients.
2. To study the existing clothing practices and clothing problems.

Methodology
The study was conducted in Kanpur district. Five specialized hospitals were selected for the present study. 100 male respondents were selected from the selected hospital, dependent and independent variables such as age, education, income, design, functional garments, costing etc. were selected. The statistical tools applied were percentage and weighed mean.

Results
Table 1: Distribution of respondents on the basis of their family type (N = 100)

Occupation	Frequency	Per cent
Service	43	43.0
Business	22	22.0
Farming	21	21.0
Labour	14	14.0
Total	100	100.0

It is very common to understand that those who are in the service and business sector cannot afford to take leave from their job for too long. So unfortunately, if they suffer from fracture limbs it is a great problem for them. It becomes compulsory to choose the right clothing that suits their job and gives them ease, comfort and confidence. On the other hand, the farming and labour class is not financially sound as their business counterparts, so they have to manage with certain alterations in their regular clothing to suit their requirement during a fractures condition. Thus, it can be affirmatively said that occupation has a direct effect on the choice of specific clothing for fractured patients.

Table 2: Knowledge about the function of clothing

Function of clothing	Yes	No	Mean score	Rank
Protection	70 (70.0)	30 (30.0)	1.70	III
Comfort	85 (85.0)	15 (15.0)	1.85	II
Cost	60 (60.0)	40 (40.0)	1.60	IV
Latest fashion	90 (90.0)	10 (10.0)	1.90	I
Personal style and creativity	70 (70.0)	30 (30.0)	1.70	III

For sports	10 (10.0)	90 (90.0)	1.10	IX
Hygiene and sanitation	15 (15.0)	85 (85.0)	1.15	VII
Protection from/during conflicts and war	8 (8.0)	92 (92.0)	1.08	IX
Occupational function	10 (10.0)	90 (90.0)	1.10	VIII
Show social status	55 (55.0)	45 (45.0)	1.55	V
Religious purpose	25 (25.0)	75 (75.0)	1.25	VI
Political purposes	10 (10.0)	90 (90.0)	1.10	VIII

(Figures in parenthesis indicate percentage of respective values)

Depending on the type of use, the functional requirements vary, and a compromise may have to be achieved. Textiles and clothing are generally acquired for longer use, and some degree of durability is expected. A high durability fabric (ie possessing high mechanical strength and dimensional stability) may be a thick and high density fabric, which however then generally is stiff and mechanically less comfortable.

Clothes made of a particular quality are used by people working in some special jobs like chefs who work in the kitchen have to wear an apron, a hat and a mask while cooking so that the food they make remains hygienic and is not contaminated. Also people working in food factory have to follow similar dressing code. Surgeons too have to follow a dressing code.

Table 3: Distribution of respondents on the basis of type of fractures (N=100)

Sl. No.	Categorization of respondents	Frequency
I.	Upper arm and shoulder joint (n_1=12)	
	i. Upper arm	0
	ii. Upper arm and shoulder joint	8*
	iii. Shoulder joint and elbow	2
	iv. Upper arm and elbow	2
II.	Lower arm and wrist (n_2=12)	
	i. Lower arm	7*
	ii. Wrist	3
	iii. Lower arm and elbow	1
	iv. Elbow and wrist	1
III.	Lower leg and ankle (n_3=44)	
	i. Knee	6
	ii. Lower leg	25*
	iii. Ankle	3
	iv. Lower leg and ankle	5
	v. Lower leg and knee	3
	vi. Knee and ankle	3
IV	Upper leg and waist (n_4=32)	
	i. Upper leg	15*
	ii. Waist	8
	iii. Upper leg and lower leg	5
	iv. Upper leg and waist	1
	v. Upper leg and knee	1
	vi. Upper leg and ankle	1
	vii. Knee and waist	1

$N = (n_1+n_2+n_3+n_4)$ 100

A patient suffering from fracture in limbs will have difficulty in wearing pull-on clothes like T-shirts and clothes that are too tight and need to be tied or button fixed. She will require clothing that slips on easily, has elastic and does not have fasteners like buttons, hooks, belts, etc. So, it should be kept in mind by experts and garment manufacturers to design such clothing that suits the specific needs of patients with fractures in upper and lower limbs.

Table 4: Problems faced by patients in wearing clothing

Problems faced by patients	Yes	No	Mean score	Rank
Limited mobility	10 (10.0)	90 (90.0)	1.10	V
Improper use of fasteners and openings	15 (15.0)	85 (85.0)	1.15	IV
Size of clothing	8 (8.0)	92 (92.0)	1.08	VI
Comfortable fit	10 (10.0)	90 (90.0)	1.10	V
Physical problems	5 (5.0)	95 (95.0)	1.05	VII
Limited clothing choice available with elastic bands	25 (25.0)	75 (75.0)	1.25	II

Loose of interest in personal dressing	10 (10.0)	90 (90.0)	1.10	V
Hesitation and lack of privacy	24 (24.0)	76 (76.0)	1.25	III
Effect of medication (dizziness and stiff joints)	15 (15.0)	85 (85.0)	1.15	IV
Limited choice of clothing according to weather	70 (70.0)	30 (30.0)	1.70	I
Tight fitting under garments	70 (70.0)	30 (30.0)	1.70	I

(Figures in parenthesis indicate percentage of respective values)

When one thinks about hospital attire, the image that comes to mind is generally a medical hospital gown. These pieces of clothing help patients to be fully covered while allowing doctors and health care professionals the access they need to conduct tests and to administer care. The open-backed, pantless gowns that leave the lower body exposed are common attire for hospitalized patients in many countries. But some doctors argue the garments may strip patients of their dignity and self-esteem, and push them into the passive and low-status "patient role. There are a number of ways in which the hospital system traumatizes patients, and one of those is that we take away the patients' clothes and put them in a somewhat depersonalizing, unisex blue gown, when that's not completely necessary. Offering gowns in a range of different fabrics helps to keep patients comfortable. Some individuals have allergies or sensitive skin.

Conclusion

Garments that are tailor-made are very expensive, and requires special tailoring skills. Patients with highly sensitive skin have to consider the skin contact or tactile properties and avoid clothing with hard seams. For wheelchair users and for persons lying prolonged time in bed, who have a relatively low heat production, the thermal comfort properties are important. The transmission of sweat from the skin is also a frequent problem. Also the mechanical durability of the materials in certain parts of the products can be a problem in many cases. These problems are not unique for disabled people but might occur for all consumers. Such problems are dependent upon an individual`s needs, and should basically be identified by the user or carer in each case.

Recommendations

1. Clothes should be comfortable and loose-fitting.
2. Avoid back fastenings and tight-fitting garments if the person has limited movement of his arms.
   - When buying trousers ‘off the peg’ it may be necessary to buy a pair with a longer inside leg measurement to ensure the correct waist size. Alterations may then be needed to achieve the correct inside leg measurement.
   - Braces can be more comfortable than a tight waistband on trousers or a belt and will help to ensure that the trousers remain in position.
   - A jacket worn undone can hide an oversized shirt and help to disguise a tummy bulge.
   - The patient may need to wear a longer length shirt or top to accommodate the lower waist style.
3. Clothes with front pocket are much more accessible if the person is sitting down most of the time.
4. Velcro trips can be inserted in trouser seams if zips cause difficulty.

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