

DEVELOPMENT AND ASSESSMENT OF MULTI-LAYERED WINTER CLOTHING FOR THE ELDERLY

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ABSTRACT

Clothing for elderly people is designed for easy dressing, comfort and style while addressing the challenges of potential decreased mobility, need for maintenance of independence and the possible need for assisted dressing. While many disabled adults find layered garments the solution to their dressing issues, majority of customers are age 80 plus, with a growing number in their 90's and beyond. Hence it focus on the style, fabrics, prints and design that women and men in those age categories seems to prefer. The present investigation was carried out in Ludhiana city for studying the winter clothing needs and practices of elderly and designing and construction of layered garments for respondents (Five Male and Five Females) selected through purposive sampling. Interview schedule was used as a tool for data collection. The results showed that most of the respondents preferred layered clothing in winters. Ten layers from different fabrics were prepared. The Thermal Insulation of prepared layered samples was tested by using Standard Test Method ASTM D 1518 (From NITRA Ghaziabad). Out of ten layers eight fabric layers were selected for preparing the garments for two male and two female respondents. Most preferred fabrics were the woven cotton, wool blended fabrics and knitted cotton for layering. The prepared garments were assessed for the factors such as comfort, warmth, ease of donning and doffing, wash ability and cost effectiveness. All the garments were found to be highly acceptable by the respondents.

Keywords: *Assessed, Donning and doffing, Elderly, GSM (Grams in square meter), Multi-layered, NITRA (Northern India Textile Association), Thermal insulation, Warmth.*

I INTRODUCTION

Clothing is one of basic needs of a human being to survive on this planet to protect him from harsh cold winter winds and strong summer energy consuming ultraviolet rays in summers. Since with the advancement of science and technology and improved medical facilities available at your doorstep the age of elderly population has increased and the ageing process is delayed.

Old age is the chronological age, a universal phenomenon and a challenge to everyone who reaches it irrespective of occupation, skill or learning ^[6].

In general terms, Ageing refers to retirement, loss of physical function and mental capacity accompanied all too often with isolating the individual from the normal activities of family as well as society ^[4].

India has around 100 million elderly at present and the number is expected to increase to 323 million, constituting 20 per cent of the total population, by 2050. Clothing can help people adjust to temperature variations in their environment. In order to be comfortable many elder people need clothing that provide extra warmth during winter especially in northern zones of India by trapping and holding warm body heat in dead air spaces between the body and layers of clothing.

Multi layered garments are particularly relevant in these times, where clothing must at the same time transfer moisture and provide warmth. In a hot and dry climate, clothes have different functional requirements: they must block the radiation from the sun, and allow for sufficient air circulation ^[1].

As one ages, it becomes more difficult to move, stretch, bend and twist, making the process of dressing a bit of a challenge at times. So, the clothing for the elderly should be made of natural fibres that breathe and which can be washed frequently. Stretchy fabrics are easier for those with paralysis, pain or decreased limb function, so, there is a need to develop clothing for elderly which should be age appropriate, easy to wear and easy to care ^[2].

Layered clothing should be designed to ensure the thermal protection property and usability of the winter clothing for the elderly who are not able to maintain their core body temperature in winters. Hence, problem of dressing and undressing can be minimized by developing layered clothing for them. Keeping in view that the elderly people face a number of problems in donning and doffing many layers of clothing during winters, the present study has been planned.

Thick clothing which can help to insulate their bodies to fight cold and fine ones will help them to feel cold during summers ^[5].

Comfort was considered important factor while purchasing clothes for elderly. Majority of elderly people preferred fabrics made from natural fibres for different occasions and in summers, prefer easy care and maintenance of their garments. Whereas, in winters most of elderly people prefer fabric made from blended fibres (spun, terry wool, cots wool) having smooth textures. Neutral, light and dull colours were most preferred ^[3].

II OBJECTIVES

- 1) To design and develop the garments from the fabric layers having maximum thermal insulation.
- 2) To analyse the clothing problems encountered by the elderly in winter season.

III LIMITATION

- 1) The study was conducted by considering only the thermal insulation property and GSM of the fabrics for developing the layered garments.
- 2) Two layers of fabrics were only used for constructing garments because multi layers develop bulky and heavy garments which would be difficult to carry by the elderly.

IV METHODOLOGY

Methodology is the mode or method of collecting data for the study undertaken. It deals with the methods and procedures used in execution of the study. A well-developed interview schedule was used to collect the data

from the purposively selected respondents of the age group of 65 years and above. For that data collection five males and five female respondents were selected and their responses were marked on the developed interview schedule. Weighed mean scores and ranks were used to gain an insight into the type of garments preferred by the respondents for winters and their preferences for layered garments.

4.1 Testing of fabric properties

1) Fifty winter fabrics were collected from the local market and 10 layers from different fabrics were prepared. Each fabric in the layer was tested for properties like type of fibre, fabric construction technique by usual inspection, the thermal insulation and GSM was measured in a metric scale of the fabric. The Thermal Insulation of prepared layered samples was tested by using Standard Test Method ASTM D 1518 (From NITRA, Ghaziabad).

2) Out of ten layers, eight fabric layers were selected for preparing two garments each for two males and two female's respondents selected for the case study.

V RESULTS AND DISCUSSIONS

TABLE 1: Properties of fabric used in developed layers

Layer I	Type of fibre	Fabric construction technique	GSM
Fabric I	Cotton blend	plain weave	0.21
Fabric II	Acrylic	Knitted	0.39
Layer II			
Fabric I	Polyester blend	Rib weave	0.20
Fabric II	Acrylic	knitted	0.34
Layer III			
Fabric I	Cotton	Rib weave	0.25
Fabric II	Nylon	Knitted	0.15
Fabric III	Acrylic	Knitted	0.30
Layer IV			
Fabric I	Polyester blend	plain weave	0.16
Fabric II	Nylon	knitted	0.28
Layer V			
Fabric I	Cotton+ wool	Twill weave (1/3)	0.42
Fabric II	Acrylic	knitted	0.34
Layer VI			
Fabric I	Acrylic	knitted	0.32
Fabric II	Acrylic	knitted	0.34
Layer VII			
Fabric I	Polyester	Twill weave (2/1)	0.25
Fabric II	Wool	Knitted	0.41
Layer VIII			
Fabric I	Acrylic	Knitted	0.43

Fabric II	Acrylic	Knitted	0.28
Fabric III	Polyester+ Acrylic	Knitted	0.20
Layer IX			
Fabric I	Polyester blend	Plain weave	0.20
Fabric II	Acrylic	Knitted	0.28
Layer X			
Fabric I	Cotton +Polyester	Twill weave(2/1)	0.20
Fabric II	Nylon	Knitted	0.23
Fabric III	Acrylic	Knitted	0.28

Table I reveals the properties of fabrics used in developed layers. GSM (also known as gm/2) = grams per square meter and is the metric measurement of the weight of a fabric. The nylon fabric (Layer III) was measured under GSM 0.15 which was minimum. GSM measured of Acrylic knitted fabric was 0.43 which was maximum and hence this fabric proves to have thickened layering.

TABLE II: Thermal insulation of the selected fabric layers

Sr. No	Fabric Layer	Thermal Insulation(clo)
1.	Sample ₁	0.75
2.	Sample ₂	0.59
3.	Sample ₃	0.75
4.	Sample ₄	0.48
5.	Sample ₅	0.66
6.	Sample ₆	0.64
7.	Sample ₇	0.80
8.	Sample ₈	0.80
9.	Sample ₉	0.60
10.	Sample ₁₀	0.85

*clo is used as a measurement of clothes thermal insulation

Table II reveals the thermal insulation values of prepared layers. The tested samples were prepared using 2 and 3 layers of different fabrics. It is clear from the table that Sample 10 had the maximum value of 0.85 clo, followed by samples 7 and 8 with value 0.80 clo and the least value was found to be 0.48 for sample 4. If compared with the GSM given in table I, it is evident that lesser the GSM of the fabric less is the thermal insulation of the layer in which it is used.

DEVELOPED FABRIC LAYERS



Layer 1



Layer 2



Layer 3



Layer 4



Layer 5



Layer 6



Layer 7



Layer 8



Layer 9



Layer 10

TABLE III Assessment of acceptability of constructed garments by the respondents

Factors	Rating Scores							
	Garment R1G1	Garment R1G2	Garment R2G1	Garment R2G2	Garment R3G1	Garment R3G2	Garment R4G1	Garment R4G2
Comfort	90	90	90	60	60	60	90	90
Wash-ability	60	60	60	60	30	60	90	90
Warmth	90	90	90	90	90	90	90	90
Don and doff	60	60	90	90	90	90	90	90
Cost effectiveness	30	60	60	60	60	60	60	60
Total scores	330	360	390	360	330	360	420	420
Mean score	66	72	78	72	66	72	84	84

*90 means highly satisfactory, 60 means satisfactory and 30 means unsatisfactory

Table III reveals that suitable index was formed to assess the acceptability of the garments constructed by the investigator. The results of acceptability assessment are furnished in the

Garment R1G1 found to be highly acceptable. Highest scores (90) were given each to comfort and warmth. Least scores were given to the cost effectiveness. Garment R1G2 also found to be highly acceptable. Again highest scores (90) were given the comfort and warmth. Satisfactory scores (60) were given to the wash-ability, don and doff and to cost effectiveness.

Garment R2G1 found to be highly acceptable by the respondent R2. Highest scores (90) were given each to comfort, easy to don and doff and warmth. Satisfactory scores were given to the cost effectiveness and wash-ability. Garment R2G2 was also found to be highly acceptable. Highest scores (90) were given to the factors such as easy to don and doff and warmth. Satisfactory scores (60) were given to the wash-ability, comfort and to cost effectiveness.

Respondent R3 found the garment R3G1 to be highly acceptable. Highest scores (90) each were given to the factors like easy to don and doff and warmth. Least score were given to the factor namely wash-ability. Garment R3G2 was also found to be highly acceptable. Highest scores (90) were given to the factors like easy to don and doff and warmth. Satisfactory scores (60) were given to the wash-ability, comfort and to cost effectiveness.

Garment R4G1 was also found to be highly acceptable. Highest scores (90) were given to the comfort, easy to don and doff, warmth and wash-ability. Satisfactory scores were given to the cost effectiveness. Garment R4G2 was also found to be highly acceptable. Highest scores (90) were again given to the most of the factors such as comfort, wash-ability, don and doff, warmth. Satisfactory scores (60) were given to cost effectiveness.



Plate 1: R_1 wearing R_1G_1 and R_1G_2



Plate 2: R_2 wearing R_2G_1 and R_2G_2



Plate 3: R_3 wearing R_3G_1 and R_3G_2



Plate 4: R_4 wearing R_4G_1 and R_4G_2

VI. CONCLUSION

Clothes offer a field in which we can explore the cultural constitution of age. Clothes are cultural artifacts, embedded in current and historical sets of meaning, shaped by social and economic forces. Age has always been a one of the key structuring principles, and we should not be surprised to find it reflected at the bodily level in the clothes that people wear. There is an extended plateau of late middle years, broken by the onset of serious disability or illness. Due to this, dressing up is a part and parcel of their inability and disorders^[7]. Hence it can be concluded from the present study changing weathers especially in northern zones brings changes in their clothing wear for insulation through layered garments in chilling winters on the other hand help to radiate heat in hot loo summers. Hence the postmodern dream of self-fashion and easy wear and tear has been exaggerated, certainly in regard to old age and the role that appearance and dresses play in its constitution. As many critics have commented, old age is not optional even in the land of postmodernity.

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