

KHADI: A HERITAGE FABRIC FOR SELF-RELIANT INDIA

Authors

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Introduction

Khadi is a hand-spun and hand-woven fabric from India and has historical significance for bringing about extensive rural empowerment (Coleman, 2003). The term 'khadi' perhaps originated from the Hindi word '*Khad*' or '*pit*'. *Khad* is a native name for the pit in which the weaver is seated at ground level and operates the loom with his legs and feet. It is also probable that the name khadi is derived from *khaddar*, a traditional native word for handspun and hand-woven cloth (Hankin, 2008). It is primarily made of cotton, which is spun by hand into yarn on a spinning instrument known as '*charkha*' (spinning wheel). The other raw materials include silk or wool, which are also spun and then hand woven (Mishra, 2014).

Khadi is a natural, hand-crafted, eco-friendly, bio-degradable and non-exploitative niche product. The khadi sector is considered to have potential for employment creation for artisans at their doorsteps with a very low capital investment (Singh, Laxmi and Singh, 2014). Khadi is considered a fabric that embodies purity and simplicity. Khadi fabrics and their products are available in a wide variety (Khadi and Village Industries Commission, n.d.). The versatility of the fabric lends itself to use in apparels, home furnishings and fashion accessories. Khadi does not require power; manual labour is the basic input of energy. Khadi cloth is generally much more porous and that gives it a soft and well-ventilated feel (Else, 1988). The twist of the hand-woven yarn is generally less than that of mill yarn and less twist helps improve its absorption properties. Many types of ready-to-wear apparel are also being made from it like tops, shirts, trousers, jackets, skirts, handkerchiefs, ties, vest and jackets, *dhoti*, *salwar kameez*, *kurta payjama*, *sarees*, *dupattas* and so on. Khadi is also used in upholstery, bedspreads, curtains, table linen, kitchen linen, cushions, blankets and bags (Khadi and Village Industries Commission, n.d.).

The world is becoming more environmentally friendly and ecologically aware. With the increase in demand for natural products that are environmentally friendly, the position of khadi is strong as it is eco-friendly. This fabric is extremely versatile in product creation and in terms of seasonal usage. Since khadi is made on a handloom, the woven designs are distinct, durable and easy to maintain. It meets the twin objectives of green production and employment creation (Reddy, 2009).

Significance of the Study

The Indian government is promoting the 'Make in India' campaign and is trying to boost the rural economy through the generation of employment. Initiatives are being taken by the government of India to promote the use of khadi products in various departments including police forces, government hospitals, railways, and airlines (Jha, 2016). According to the Ministry of Micro, Small and Medium Enterprises (MSME) there is a big market for school uniforms in the country and promotion of khadi uniforms will lead to the growth of the rural economy (Vikram, 2016). *The objective of this study is to assess the feasibility of introducing khadi for use as school uniforms.*

Methodology

To accomplish the objective, firstly the locale was selected, followed by the selection of a sample, the development of tools, feedback on present school uniforms, the development of prototypes, field testing of the prototypes, and finally feedback from mothers.

Government and public schools in two cities, Delhi and Faridabad, were selected. Five government and five public co-educational schools were selected through convenience sampling. Information was obtained from ten school principal/teachers in charge about school uniforms. The inclusion criteria for selection of schools was the willingness of the school principals to participate in the study and that they were co-educational schools where both girls and boys can be included in the study.

Subsequently, two government and two public schools were shortlisted for the study. Feedback regarding fabrics, colour and components of present school uniforms, problems experienced with present school uniforms and so on, was collected from one hundred mothers using purposive sampling method. Information was collected through semi-structured interviews. The responses received from school authorities and mothers were entered in MS Excel; data was tabulated and worksheets were prepared. Detailed content analysis of the data was done to identify problems in present school uniforms.

Prototypes of khadi and present school uniforms were developed, and field testing was done for a period of four months in a school to compare khadi school uniforms with their present uniforms. The inclusion criteria for selection of school for testing of prototypes were:

1. willingness of the school principal to allow students to participate in the study; and
2. willingness of students and mothers to participate in testing of prototypes.

After completion of the test period, both sets of uniforms were collected from each student with their feedback forms which were provided to students and mothers during field testing. Students and mothers were asked to rate the uniforms from '1' to '5' based on their experience after using their present school uniform and the khadi uniform for one month and four months,

respectively. The uniforms were analysed in terms of shrinkage/extension of fabric, colour fading and pilling after use. A Likert scale was used to analyse the experiences of students and mothers with respect to various factors given in the feedback forms.

Results and Discussion

This study introduced khadi as a fabric for school uniform. Khadi as a fabric for school uniform of children would ensure regular usage by children accompanied by ensuing familiarity with khadi amongst children. This familiarity would hopefully lead to habitual use of khadi as children progress into adulthood so as to connect them with our roots. In this context, efforts were made to compare the properties of khadi and present school uniforms.

Feedback regarding present school uniforms

To explore the possibility of introduction of cotton khadi for the school uniforms of five government and five public schools (all co-educational) situated in New Delhi and Faridabad were selected.

Feedback on present school uniforms from principals/ teachers

Feedback on the present school uniforms was sought from the principal or from one teacher from each school. According to data received, all the teachers/principals felt that uniform plays an important role in the overall schooling experience of a child. In their opinion, foremost, it gives a sense of belongingness to the student. It brings equality, uniformity and parity amongst students. They are on the same level without any discrimination between rich and poor. It is a symbol of homogeneity; it reduces distraction and escalates attachment with each other. School uniforms give a feeling of responsibility and make the students confident and disciplined.

It was found that all schools had separate uniforms for children of different age groups. The basic components in school uniforms were half or full sleeves shirt/t-shirt or *kameez* as the upper garment and shorts, trouser, trackpants, skirts or *salwar* as the lower garment. A sweater or blazer was used in winter and the common prescribed accessories were neck ties (in seven schools), socks, belts and shoes. As informed by respondents, mostly cotton and terecot were used as fabrics for school uniforms in summer whereas cotton, terecot and terewool were used in winters.

According to the respondents, various factors were considered while designing school uniforms. The design and colour of school uniforms was decided keeping in mind the comfort and aesthetics of the uniform in which students look smart and disciplined. According to the respondents, the design should be simple; colour should be soothing and according to climatic conditions. It should not be too loud or dull; it should be of medium hue and should be appropriate for school uniform.

Issues and suggestions related to present school uniforms

Out of ten principals/teachers, only three pointed out about a few problems or complaints they received regarding school uniform from the students or their parents. These are given below:

- de-shaping of uniform during washing was observed
- colourfastness problem was noted.

According to responses received, it was found that all the principals/teachers were aware of the properties of khadi fabric; that it is light, soft and comfortable to wear. Seven of them were willing to use khadi in school uniforms but they were not sure about its maintenance and cost. They were willing to use khadi uniforms provided these are easy to maintain and should be affordable. Principals/teachers of three schools were not willing to try khadi uniforms as they had no plans to change uniforms in the near future.

Feedback on present school uniforms from mothers

From the ten selected schools, two government and two public schools (both co-educational) were further shortlisted which were willing to have khadi as their school uniform. The details of selected schools are given below in Table 1. Feedback on the present school uniform from 100 mothers (25 mothers from each school) from classes VIII and IX was collected.

S.No.	Government Schools (Delhi)	Public Schools (Faridabad)
1	Navyug School, Peshwa Road	Vidya Mandir Public School
2	Navyug School, Mandir Marg	A.V.N Senior Secondary School

Table 1. List of selected schools for gathering feedback from mothers

The major problems faced by mothers on current school uniforms after several uses related to maintenance such as creasing/ ironing/wrinkling followed by size or fit, quality of stitching, seam or button ripping, durability, colour fading, pilling, shrinkage and de-shaping (Figure 1). These factors are essential for desirable appearance in the uniform.

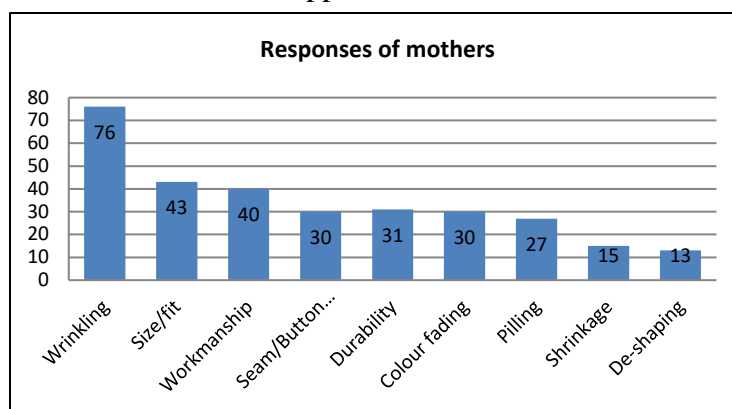


Figure 1. Problems faced in school uniforms

Information was obtained from mothers on their preference for khadi as school uniforms. It was found that 33 per cent of mothers were willing to accept change in the fabric of the school

uniform whereas 67 per cent were not willing to accept change. Although 85 per cent of mothers were aware of khadi fabric, most were not open to change as it would lead to additional expenditure on uniforms. Parents of children in Vidya Mandir Public School, Faridabad, were more open to change the uniform as this school already had a khadi uniform for teachers and staff members.

Field testing of khadi uniforms

To check the feasibility of introducing khadi as a fabric in school uniforms, development of prototypes and their field testing was carried out. Vidya Mandir Public School, Faridabad was selected for the field testing of prototypes as this school was interested in having khadi school uniforms. Details of the summer uniform of the above school are given below in Table 2.

School	Summer Uniform					
	Boys			Girls		
	Upper	Lower	Accessories	Upper	Lower	Accessories
V.M.P.S	Off-white half sleeve shirt	Beige trousers	Ties -- Brown Socks – beige-brown Belt – Brown Shoes – Black	Off-white half sleeve shirt	Beige divided skirts	Ties – Brown Socks – beige-brown Belt – Brown Shoes – Black

Table 2. Summer school uniform of Vidya Mandir Public School, Faridabad

The basic components of school uniform of boys and girls had half sleeved shirt as upper garment and trousers or divided skirts as lower garment. Ties, socks, belt, shoes were used as accessories (Figure 2).



(a)

(b)

Figure 2. Present school uniform of Vidya Mandir Public School, Faridabad (a) Boys and (b) Girls

The fabric of the present school uniform was terecot made on a powerloom. Terecot is mostly used in school uniforms as it is durable and easy to maintain. As it was a comparative study, it was therefore decided to use a similar khadi terecot fabric (Polyvastra) for prototype testing. The basic difference between khadi and powerloom is the method of spinning and weaving as given in Table 3.

Operations	Khadi	Mill-made
Spinning	Hand spinning or charkha spinning	Electrically operated spinning machine
Weaving	Handloom	Electrically operated powerloom

Table 3. Difference in khadi, handloom and mill made fabrics

Yarn spun on a *charkha* has a twist in the direction of letter 'S'. The mill yarn usually has a twist in the direction of letter 'Z' (Figure 3). The difference between khadi and mill-made fabrics is apparent in the texture.

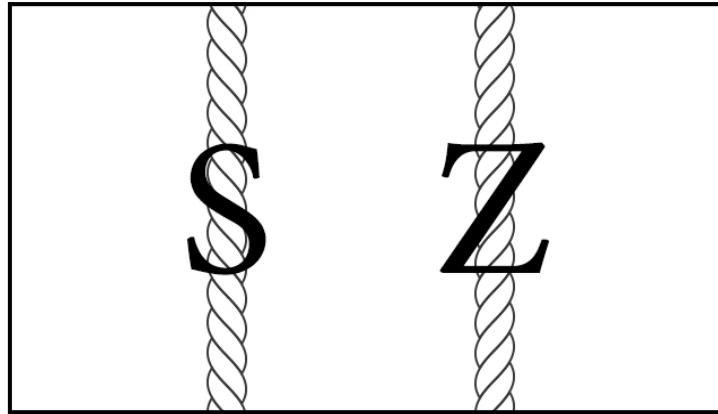
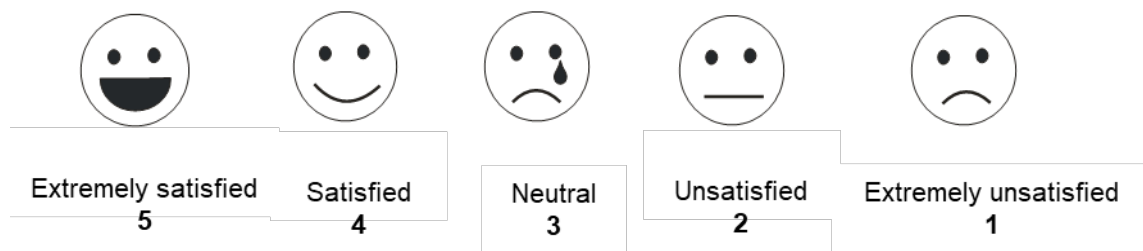


Figure 3. S twist and Z twist. Source: Superior Threads (n.d.)

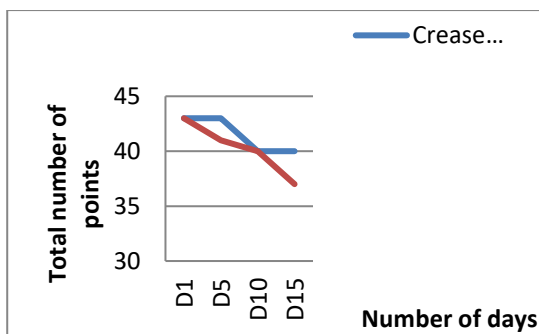
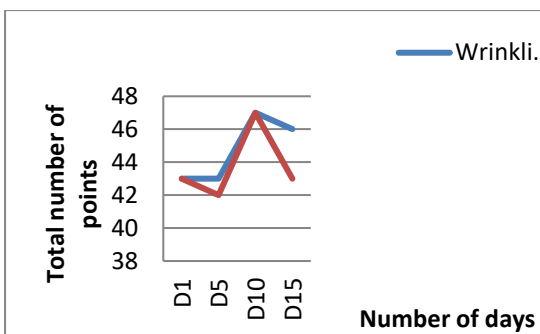
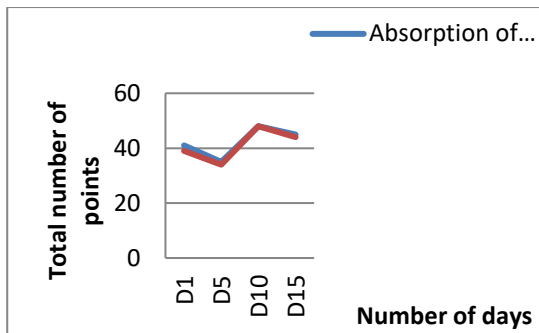
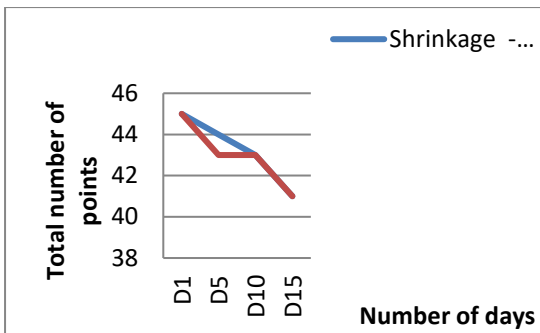
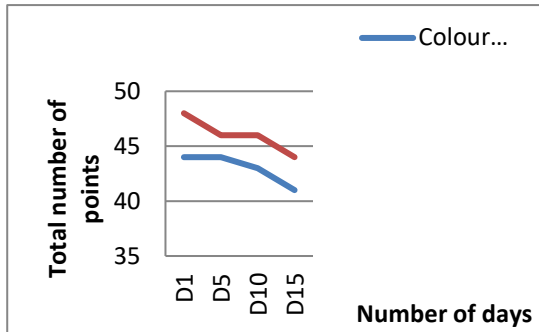
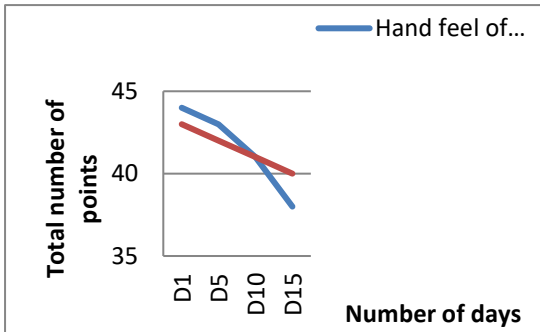
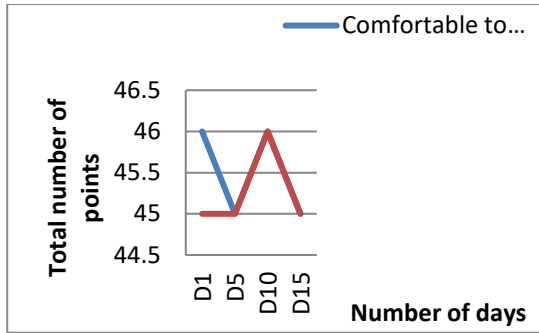
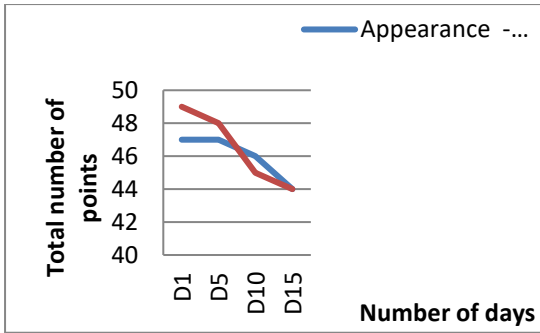
A sample of 20 students (10 boys and 10 girls) was selected from the school from classes VIII and IX. These were divided into two sets of five girls and boys each. Each student was provided with one new set of the present uniform and one set of the khadi uniform. All the students were asked to wear the two sets of uniforms on alternate days. Uniforms of one set of five girls and boys were tested and evaluated after regular use for one month. Uniforms of the other set of five girls and five boys were tested after regular use for four months.

Assessment of present and khadi uniforms by students and mothers

A Likert scale was used to analyse the experiences of students and mothers (SM) after using the present uniform and the khadi uniform with respect to various factors. The uniforms were used on alternate days for 15 working days and ratings were provided from ‘1’ to ‘5’ according to their satisfaction level. Scores for the responses to each question were added and compared between khadi and power-loom uniforms.



The performance of different factors in the present and khadi school uniforms can be seen in Figure 4 below. It can be seen from results that the performance of khadi uniforms was found to be better than present uniforms in factors such as hand and feel of fabric and colour fading after using it for 15 alternative working days. Results of other factors such as appearance, comfortable to wear, shrinkage, absorption of sweat and ironing were found to be similar.



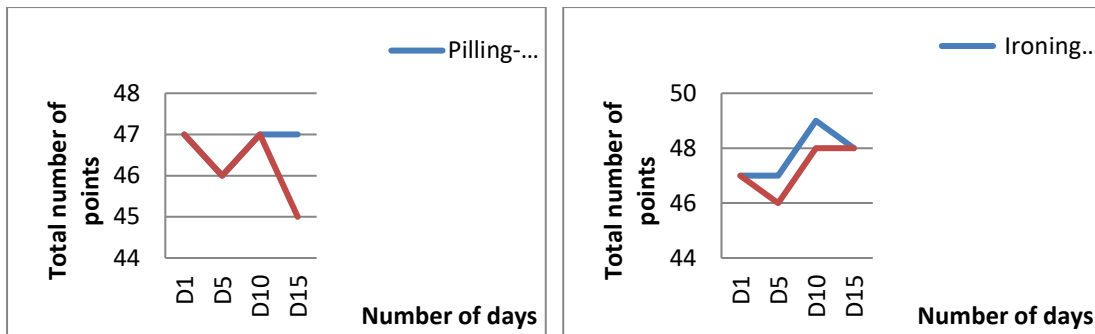


Figure 4. Line graphs showing performance of different factors in present and khadi school uniform

The performance of khadi uniform with respect to three factors, that is wrinkling, crease retention and pilling, was found to be slightly low as compared with the present school uniforms. The photographs of both the uniforms during testing have been given in Figures 5 and 6.



Figure 5. Present school uniform of Vidya Mandir Public School, Faridabad during field testing



Figure 6. Khadi school uniform of Vidya Mandir Public School, Faridabad during field testing

Assessment of present and khadi uniforms by students and mothers after four months

Overall feedback from the mothers on their experience of using present uniforms and khadi uniforms was collected.

Present uniforms: Six out of ten mothers thought that it was a good uniform with fine fabric, appearance; it was comfortable and easy to maintain. They did not have any problems with the present uniform. Four out of ten mothers found it quite unsatisfactory for their children to wear for long hours in scorching heat. According to them, it was heavy, it did not allow for the passage of air, it did not absorb sweat and got lot of wrinkles that looked very untidy. The lower garment was satisfactory but the shirt was little bit transparent.

Khadi uniforms: Seven out of ten mothers found khadi uniforms good and comfortable. Their experience was positive towards the dress and they did not have any problems with the uniform. It had good appearance and the uniform seemed to perform better than the present uniform as it did not shrink or stick to body during sweating. The students did not feel any irritation after wearing khadi uniform. Three out of ten mothers had problems such as shrinkage, ironing and difficult to maintain.

An overall rating of '3' was given to present school uniform and '4' to khadi uniforms after testing for the entire duration of four months. On asking for their preference and recommendation to switch to khadi fabric for school uniform mothers were satisfied with the performance of khadi uniforms. The photographs of both the uniforms after field testing for four months are given in Figures 7 and 8.



Figure 7. Present school uniform after using for four months



Figure 8. Khadi school uniform after using for four months

Costing

A comparison of the production cost of present uniforms and khadi uniforms was done as given in Table 4. It was found that khadi uniforms were almost double in price than the present uniform. As khadi is handmade fabric, its price is higher. However, its performance was better than fabric of present uniform. It was found that the market price of the present uniform was Rs. 345 for shirt, Rs.435 for trouser and Rs. 440 for skirt.

Season	Present uniform	Khadi uniform
Fabric rate	Upper: Rs. 72 per metre (width 90 cms) Lower: Rs. 145 per metre (width 150 cms)	Upper: Rs. 174 per metre (width 90 cms) Lower: Rs. 348 per metre (width 150 cms)
Average	Shirt: 2.10 mts x 72 = Rs. 151.2 Trouser: 1.20 mts x 145 = Rs. 174 Skirt: 1.50 mts x 145 = Rs. 217.5	Shirt: 2.10 mts x 174 = Rs. 365.4 Trouser: 1.20 mts x 348 = Rs. 417.6 Skirt: 1.50 mts x 348 = Rs. 522
Stitching cost	Shirt: Rs. 100 Trouser: Rs. 150 Skirt: Rs. 150	Shirt: Rs. 100 Trouser: Rs. 150 Skirt: Rs. 150
Total production cost	Shirt: Rs. 251.2 Trouser: Rs. 324 Skirt: Rs. 367.5	Shirt: Rs. 465.4 Trouser: Rs. 567.6 Skirt: Rs. 672

Table 4. Costing of present uniform of Vidya Mandir Public School, Faridabad and khadi prototypes

It can be seen from above results of field testing that khadi is more breathable, comfortable, it is not heavy and absorbs sweat well. It has been found to be good in appearance after several uses. In spite of good performance of khadi, one of its major drawbacks is that it is expensive. The price of khadi is deterring its acceptability.

Conclusion

Khadi is made by hand spinning in rural India by spinners and weavers. It is softer and much more porous than mill-made cloth which gives khadi a ventilated feel. It is comfortable and durable. Moreover, it is eco-friendly and skin friendly fabric as compared to other fabrics. Testing of prototypes of khadi school uniforms showed good performance. Thus, the school uniform sector has promising potential for use of khadi. There is a need to generate awareness amongst people about the features of khadi and promote its use.

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