POSSIBILITY OF MAKING SUSTAINABLE INFANTWEAR USING MEDICINAL PROPERTIES OF NATURAL DYES

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Abstract

As the technology is growing day by day its adverse effects on our environment, health and economy are visible and emerging. Dyeing and printing industries played a major role in polluting our air, water and land by releasing harmful chemicals in solid, liquid and gaseous states. Infant and kids are sharing a large portion of our country and therefore it is important to protect their health by adapting sustainability at the earliest. From a decade the issue to protect the environment has become a burning issue by many environmentalists. Newborn babies and kids are tender and delicate and so are their skin. Everything needs to be checked and tested twice before applying or giving it to the infants and kids. Even their bathing water, milk, food, crème, shampoo, soap everything needs to be tested and checked but unfortunately, most of us do not follow this check process for their cloths and other textile products because we prefer them to be cost effective and economic, also attractive and with low maintenance. This is because, most of us think that the growth rate of infants is much higher than a full grown or teenager. Usually, we avoid buying sustainable clothes for infants and kids due to following reasons: 1. Rare availability of sustainable infant clothing and textile products in market using natural dyes. 2. Over priced products 3. Unawareness about sustainable clothing and textile products 4. Less attractive colors and designs. In today's world everyone has a same opinion about the design innovation and development that we should go-green and create sustainable products and designs. When it comes to infant wear clothing and products, it becomes important to choose it carefully as we choose other things for them but due to high price and rare availability of the sustainable or natural products, people shift their choices to cheaper products which are generally synthetics, man-made, harmful chemical based and of low qualities which further gives body rashes to babies and poor color fastness make the color bleed which is swallowed by babies as they have a habit of putting everything in their mouth. Baby products like bibs and soft toys are generally becomes the baby's favorite chewing objects. Therefore, it is very important to make these products chemical free and use natural pigments or dyes to color them. To increase its scope and explore it in different ways, Idea is to understand the medicinal properties of natural dyes through lab testing and application & apply them to create innovative sustainable.

Paper Identification

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BACKGROUND OF THE STUDY:

As the technology is growing day by day its adverse effects on our environment, health and economy are visible and emerging. Dyeing and printing industries played a major role in polluting our air, water and land by releasing harmful chemicals in solid, liquid and gaseous states. Infant and kids are sharing a large portion of our country and therefore it is important to protect their health by adapting sustainability at the earliest. From a decade the issue to protect the environment has become a burning issue by many environmentalist. Newborn babies and kids are tender and delicate and so are their skin. Everything needs to be checked and tested twice before applying or giving it to the infants and kids. Even their bathing water, milk, food, crème, shampoo, soap everything needs to be tested and checked but unfortunately, most of us do not follow this check process for their cloths and other textile products because we prefer them to be cost effective and economic, also attractive and with low maintenance. This is because, most of us think that the growth rate of infants is much higher than a full grown or teenager. Usually we avoid buying sustainable clothes for infants and kids due to following reasons:

- Rare availability of sustainable infant clothing and textile products in market using natural dyes.
- Over priced products.
- Unawareness about sustainable clothing and textile products.
- Less attractive Colors and designs.

In today's world everyone has a same opinion about the design innovation and development that we should go-green and create sustainable products and designs. When it comes to infant wear clothing and products, it becomes important to choose it carefully as we choose other things for them but due to high price and rare availability of the sustainable or natural products, people shift their choices to cheaper products which are generally synthetics, man-made, harmful chemical based and of low qualities which further gives body rashes to babies and poor color fastness make the color bleed which is swallowed by babies as they have a habit of putting everything in their mouth. Baby products like bibs and soft toys are generally becomes the baby's favourite chewing objects. Therefore, it is very important to make these products chemical free and use natural pigments or dyes to color them. To increase its scope and explore it in different ways, Idea is to understand the medicinal properties of natural dyes through lab testing and application & apply them to create innovative sustainable wear for infant and kids. Certain natural dyes were found having anti-microbial and anti-bacterial properties and found suitable for babies skin.

METHODOLOGY:

The methodology is as follows:

As the research is applied research so the research methods are mixed methods. The initial study is based on the survey method. Both primary and secondary sources are used for collection of data. Predesigned and pre-tested natural dyed samples and questionnaires are used for the purpose of primary data collection. First- hand information is collected through direct interaction and personal investigation method. In order to make study more realistic and meaningful; the researcher visited various natural dyeing artisans and designers as well as children's wear manufacturers and consumers to get a fair idea of their needs and demands. The primary data is supported by secondary

data collected through various books, journals, websites, archives etc.

Review of literature:

A large number of institutions like NIFT, IIT, NID, IICD, IDC, NCDPD etc have researched and worked in the development of craft and sustainable products design sector of India. There are various journals, books and online blogs are also written to give a brief understanding of natural dyeing and sustainability. Also a vast range of literature is available explaining and unfolding the demerits of synthetic dyeing which gives the actual meaning to use of natural dyes in present scenario. But, very less is documented, related to natural dyes found in India and their medicinal properties, specially related to infants' wear. Some of the documented data is presented here.

On page no. 32 of Naked Fashion: The New Sustainable Fashion Revolution by Safia Minney, New Internationalist, 2012 the author very interestingly illustrated the harmful effects of enormous use of pesticides in cotton crop, especially in India and how 'people tree' is supporting small scale farmers group to produce less harmful crops of cotton, making it organic and sustainable. This book reveals various efforts made in the direction of making kids' wear sustainable. Whereas in another similar book 'To die For: Is Fashion Wearing Out the World?' By Lucy Siegle , Fourth Estate, 2011 the author Lucy is advocating the morally and ethically right fashion in contrast to fast unsustainable fashion. She also wrote about the costumer's casual buying behaviour which is not so thoughtful and often buy clothes which fits into their pockets ignoring the dirty truth of manufacturing behind them. She very well described the ugly picture of unsustainable fashion by calling it an epidemic in the world of fashion and advised the buyers and consumers to give their buying a thought before choosing and shopping fashion. In continuation to this another writer Elizabeth Cline in her book Overdressed: The Shockingly High Cost of Cheap Fashion by Elizabeth L. Cline, the penguin group, USA, 2012 described the buying behavior of consumers but she focused on the consumers of developed countries like USA and elaborated that even people in developed countries are attracted towards cheap buying which has changed their way of dressing. She also wrote about the sustainable Fashion which is future of fashion. Also, Sandy Black in his book 'The Sustainable Fashion Handbook by Sandy Black, Thames & Hudson, 2012' speaks about the fast fashion and I'll effects of industries producing it, on environment and human health. Books 'ECO COLOR' by India Flint, Page no. 15 (Prologue) clearly states that chemicals in our clothes are silent contributors of our ill health. It also provide with a very unique and creative collection of dyes and their applications which can contribute to sustainable textile and clothing and combat toxin effects on human health.

On the other hand in an article' understanding fashion consumers' attitude and behavioral intentions toward sustainable fashion products: focus on sustainable knowledge sources and knowledge types' by Hyun Min Kong, Eunjuko, JeejaChae and Pekka Mattila published in Journal of Global Fashion Marketing vol. 7, 2016 reveals that " Effectiveness and social knowledge also plays and important role in forming attitudes towards sustainable fashion products". New born skin is delicate and so is the baby's system. While there are several normal newborn rashes, chemicals, fragrances, and dyes in clothing, detergents, and baby products can cause new born skin irritation, dryness, chafing, and rashes.

An online source, www.fabricoftheworld.com published that skin irritations caused by chemicals are called Dermatitis and chemical dyes can easily cause such allergies as they contain azo based chemicals. These are the chemicals which are prevalent in most of the dyes, it says. It further explains that the most affected people are the infants as they have sensitive skin and their immune system is not fully developed to

fight off skin irritants. The heavily dyes fabrics with those dark attractive Colors needs to be avoided with the other clothes whose wash care label reads wash separately as they are not Color-fast and the dye may bleed on skin.

'Status of natural dyes and dye yielding plants in India', R. Siva, current science, 10 April 07 is an essential piece documented to reveal the miracle of natural dyes and their preparations. It reads that India has about 450 plants that can yield dyes and some of them possess medicinal value. Although, very less of them has been exploited for their uses. The lack of documentation and very less availability of information on database makes it hard to develop it easily. "Wild Color" by Jenny Dean, Potter craft, 2010 and Art Craft Natural Dyeing: Traditional Recipes Modern Use by J.N. Liles, University of Tennessee Press, 1990 not only mention about the importance of sustainability and natural dyes but also encourage the sustainable product lovers to create new developments and do eco-friendly innovations. Few of them also encourage the natural dyeing practice to demolish the dirty practices of synthetic dyeing and benefit our environment.

HYPOTHESIS

It is possible to make the skin friendly children wear using natural dyes, having certain medicinal properties.

OBJECTIVES OF THE STUDY:

The research project has following objectives:

1. Comparative study of the merits and demerits of the children's wear popular Indian brands in terms of availability, design, material, Color/ printing and suitability of the color/ dye/ pigment used, to baby skin.
2. Enhancement of design elements and sustainability of existing products in market through various natural dyeing techniques.
3. Development of value addition techniques through selected natural dyes i.e., Turmeric, Indigo, Tulsi, Catechu, Manjishtha and Neem (leaves and bark)
4. To take appropriate measures for cost effectiveness of the products and clothing as the infants grow fast and need more number of clothes compared to adults.
5. Identification of various modern applications of the selected natural dyes to be used, its significance and importance to make sustainable children wear.

TOOLS USED FOR THE ANALYSIS:

To check data reliability Cronbach alpha test has been done. Post checking the reliability of the data, Pearson correlation coefficient test has been done to find the significance level of the relationship between the variables. Tests like a multi linear regression has been done to study the sustainable children wear using natural dyes of Sanganer region of Rajasthan. All these tests have been analysed with the help of Statistical Package for the Social sciences (SPSS). The basic data is shown with the help of bar diagrams, histograms and with percentage method.

DATA TABULATION AND ANALYSIS:

Total 80 data points have been gathered for analysing the sustainable children wear using natural dyes of Sanganer region of Rajasthan. Results of the proposed study will significantly help in understanding the attributes like, socioeconomic characters, purchase of child wear, important factors, benefits of organic wear, disadvantages, cost effectiveness etc. Results will be useful to know about the sustainable children wear using natural dyes of Sanganer region of Rajasthan. Survey questionnaire of 60 questions (including sub category of the questions) other than personal information have been used as a primary instrument to collect information about the respondents. In this survey total 80 questionnaires have been distributed to the respondents for data collection. Later on, all the gathered information has been digitized using Microsoft excel and scale reliability has been done to check the reliability of the data. The filled

questionnaires were digitalized and then taken on reliable scale. For this purpose, Cronbach's alpha statistics were used. Item and reliability analysis was performed on a reliability scale. The analysis found that overall Cronbach's alpha is 0.813. Here it is pertinent to mention that Alpha value greater than 0.70 is good enough for conducting research. There is one hypothesis to be tested for the collected data. To test the hypothesis couple of questions were asked and thereafter, information gathered from 60questions have been tabulated, grouped and presented in a graphical form with average and variance details. Later on, ANOVA, a multi regression and Cronbach's Alpha test has been used to find out the significant levels.

INTERPRETATION	
INTERPRETING ALPHA FOR DICHOTOMOUS OR LIKED SCALE	
CHRONBACH'S α	INTERNAL CONSISTENCY
ABOVE 0.90	EXCELLENT
0.80-.0.89	GOOD
0.70-.0.79	ACCEPTABLE
0.60-.0.69	QUESTIONABLE
0.50-.0.59	POOR
BELOW 0.50	UNACCEPTABLE

RELIABITY OF DATA:

Cronbach Alpha for all the parameters hasshown an average scale or results, however overall Cronbach alpha value 0.813as compared with 0.70. So, it can be concluded that the data is reliable enough that can beused for further analysis.

Case Processing Summary

		N	**%**
Cases	Valid	80	100.0
	Excluded	0	.0
	Total	**80**	**100.0**

a. List wise deletion based on all variables in the procedure

RELIABILITY STATISTICS

Cronbach's Alpha	No. of Items
.813	35

Mean value of each parameter is closure to 4.30 and the standard deviation is 0.67505 for the data point of 80 respondents. Results for ANOVA with Cochran test is also significant (P-Value < 0.05), which means at 95% confidence level, data used in the study is reliable and ready to use for further analysis with the mean of 115.4250 and standard deviation of 10.22503.

SCALE STATISTICS

Mean	**Variance**	**Std. Deviation**	**No. of Items**
115.4250	104.551	10.22503	35

ANOVA WITH CROCHAN'S

	Sum of Squares	**df**	**Mean Square**	**Cochran's Q**
Between People	235.987	79	2.987	
Between Items	3713.67	34	109.225	**1935.965**
Within People (Residual)	1503.963	2686	.560	
Total	5217.600	2720	1.918	
Total	5453.587	2799	1.948	

Grand mean = 3.2979

DEMOGRAPHICS OF THE COLLECTED DATA:

According to the data where there were 80 respondents, who have responded for the questions asked in the questionnaire. Means score for all the parameters is approximately 2.57 and the mean standard deviation is 0.98598. Minimum value of the data is 2 for two attributes and remaining attributes has 1 as minimum value and Max value of the data is 5 for the five attributes, 4 for the five attributes, 3 for the nine attribute,2 for the four attribute, 6 for the three attribute and remaining one attributes has 7 as maximum value. It has been assumed that data is positively skewed for all the attributes.

Age of the respondents

	Frequency	Percent	Valid Percent	Cumulative Percent
<25	8	10.0	10.0	10.0
25-30	16	20.0	20.0	30.0
31-35	30	37.5	37.5	67.5
>35	26	32.5	32.5	100.0
Total	80	100.0	100.0	

RESPONSES BASED ON AGES:

According to the data collected from 80 respondents it is seen that 10% of the are below 25 years of age, 20% of the respondents belong to the age group in between 25-30 years, 37.5% of the respondents belongs to the age group in between 31-35 years, and remaining 32.5% of the respondents are above 35 years of age.

Gender of the respondents

	Frequency	Percent	Valid Percent	Cumulative Percent
male	52	65.0	65.0	65.0
female	28	35.0	35.0	100.0
Total	80	100.0	100.0	

RESPONSES BASED ON GENDER:

According to the data collected from 80 respondents it is seen that 65% of the respondents are male while remaining 35% of the respondents are females.

FINDINGS:

According to the Collected Data from the Respondents following Findings are Obtained:

- Data is collected from 80 respondents.
- Collected data are analyzed by ANOVA and Multiple Regression, to check the significance level of the data at 95% confidence level.
- Cronbach test has been done to check the reliability of the 300 data and the value is 81.3%.
- According to the data collected from 80 respondents it is seen that 10% of the are below 25 years of age, 20% of the respondents belong to the age group in between 25-30 years, 37.5% of the respondents belongs to the age group in between 31-35 years, and remaining 32.5% of the respondents are above 35 years of age.
- According to the data collected from 80 respondents it is seen that 40% of the respondents find option of organic or natural dyed kids wear in the market very easily, 32.5% of the respondents find it very rarely while remaining 27.5% of the respondents do not find any option of organic or natural dyed kids wear in the market.
- According to the data collected from 80 respondents it is seen that 40% of the respondents buy sustainable kids wear at economic price, 25% of the respondents buy sustainable kids wear at affordable price, while remaining 35% of the respondents buy sustainable kids wear at high price.
- According to the data collected from 80 respondents it is seen that 40% of the

respondents do not buy sustainable kids wear due to no availability, 32.5% of the respondents do not buy sustainable kids wear due high price and remaining 27.5% of the respondents do not buy sustainable kids wear as they are not aware about it.

- According to the collected data, it is seen that 60% of the respondents are agreed to the statement that chemical and synthetic dyes and materials may cause allergy on baby's skin/ kid's skin while remaining 40% of the respondents are disagreed with the statement that chemical and syntheticdyes and materials may cause allergy on baby's skin/ kid's skin
- According to the data collected from 80 respondents it is seen that 27.5% of the respondents have faced such issues like allergy with their kids, 35% of the respondents do not face any such issues with their kids, 30% of the respondents often faced such issues with their kids, while remaining 7.5% of the respondents seldom faced such issues like allergy with their kids.
- According to the data collected from 80 respondents it is seen that 27.5% of the respondents are agreed that it causes rashes, 30% of the respondents are agreed that it causes scars, 27.5% of the respondents are agreed that it causes blisters, while remaining 15% of the respondents are agreed that it causes any other kind of allergy to the kids.
- According to the data collected from 80 respondents it is seen that 27.5% of the respondents are agreed to the statement that they prefer to buy natural dyed kids wear if it is easily available on the market, 30% of the respondents are denied with the statement, while remaining 42.5% of the respondents are not sure about the statement that they prefer buying natural dyed kids wear if easily available on the market or not.
- According to the data collected from 80 respondents it is seen that 22% of the respondents would like to spend below ₹1000 on kids wear, 30% of the respondents would like to spend in between ₹1000-₹3000 on kids wear, while remaining 42.5% of the respondents would like to spend
- ₹3000 & more on kids wear.
- According to the data collected from 80 respondents it is seen that 89% of the respondents would like to buy the prepared sample kids wear and found it suitable on babies' skin after 48 hours of use, 11% of the respondents found them suitable on skin but prefer some more aesthetic features to be added to make it more attractive on kids and none found the samples allergic to kids' skin.
- Hence, it is to accept the hypothesis that 'It is possible to make the skin friendly children wear using natural dyes, having certain medicinal properties.'

SCOPE:

Sustainability through selected natural dyes of Sanganer in infant and kids wear products have been taken for study on micro level. Selection psychology for kids wear products has been enhanced to develop a strong market for sustainable products which helps to save the environment as well as the health of the consumer. Users of various occupations and age group are targeted.

LIMITATIONS:

- ❖ There are few limitations to the project which are as follows:
- ❖ The present research is confined to a limited area, product type, manufacturers and consumers.

- ❖ Product innovation measures are dynamics, a one-shot attempt may be inadequate to understand the whole scenario, utility and demand.
- ❖ General ideas will be made on the basis of survey and study, which is in limited time frame and area.

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