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Research Journal

Half Yearly Journal of Science, Arts, Social Sciences, Commerce, Home Science & Home Science Technology

RESEARCH DEVELOPMENT CELL

Estd. 1932

WOMEN'S EDUCATION SOCIETY'S

LADY AMRITBAI DAGA COLLEGE FOR WOMEN OF ARTS, COMMERCE & SCIENCE AND SMT. RATNIDEVI PUROHIT COLLEGE OF HOME SCIENCE & HOME SCIENCE TECHNOLOGY

NAAC - Re-accredited 'A' Grade

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(A Peer-reviewed Journal)

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Editorial

Welcome to Volume 11 of Research Journal! This issue of research Journal features the work of authors from several varieties of disciplines: Home Science, Home Science Technology and Science.

Technology has changed the quality of life- it either enhances the health, knowledge and understanding or upgrades the quality of life; boosting the economy of the entire nation. Developmental profits cannot be restricted to the elite few and hence extension of technology in tribal life and innovation, adoption and evaluation of its benefits has been popularly researched and so is amply reflected in this volume. However, a major man-made side effect of this technologically superior life, has erupted as a problem in social skills wherein children in a nuclear and single child family have started showing symptoms of problematic attitudes as has been concluded in one research paper. In a shift from traditional to modern pattern of living, stress has erupted as an outburst beyond comfort zone crossing all over the human age span but particularly afflicting the young and youths alike. A research paper highlighting the need of special programs of Stress relaxation techniques (SRT) and Stress management strategies (SMS) to reduce stress has been incorporated in this journal and the conclusions drawn needs to be thoroughly dealt with. Another side –effect of the highly sophisticated mechanical world today is less utility of the natural tools gifted to man- to move. Human beings are sufficiently bone light to allow mobility. The pathological process of bone weakening –"osteoporosis" is a global public health problem-linked mainly with bone mass, calcium: phosphorous ratio, obesity, Vitamin D deficiency and life style factors. Healthy mind in a healthy body is not the fashion mantra for the youths today-they need a substantial healthy display –which is given none other but by the skin- the supreme sheath. Development of multi-benefit cream using the locally available mango seed oil –not only enhances skin beauty but also gives an insight into the entrepreneurship incorporating tribal employment. Another research paper on antimicrobial pattern of six medicinal oils against bacterial isolates suggests the inter-disciplinary benefits of research in fields wherein the powerful antibacterial activity of medicinal oils can be used for aromatic therapies. Research papers on traditional handicraft sector, colour preferences by mentally handicapped children, role of gender in the choice of Physics as a subject in undergraduate courses and a paper to judge knowledge and its application regarding major threat of plastic pollution are included. Echo fashion- the latest trend word in the design philosophy announces that fashion is not just limited to our wardrobes but it penetrates to every aspect of one's life. The three R's: Reduce, Reuse and Recycle-are the three eco-conscious and socially responsible methods of production. Yet another convincing paper reviews research on Diabetes and its Dimensions, Determinants, Dynamics and Directions for public health action. Dyslipidemia needs to be treated by Diet rather than Drugs and because of the additive cardiovascular risks-it should be treated as part of a comprehensive diabetes care. Topping the list is quite a technical research paper on power system protection using digital signal processing approach and to end the list is again a technical research article on transformer design optimization.

Dr. Deepali Kotwal
Editor-in-chief
Research Journal Vol. 11, No. (2), 2015
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Research Journal

Vol. **11** No. **(2) 2015**

Contents Page No.

★ **Textiles and Clothing**

- **Hotel Management and Catering Technology**

- **Science**

- **Research Articles / Review Papers**

Power System Protection using Digital Signal Processing Approach

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Abstract

DSP (Digital Signal Processing) has made large inroads into almost every field of engineering in general and electrical engineering in particular. The protective relaying finds DSP particularly attractive because the problem of relaying is numerically intensive on one hand and on the other hand demands a quick trip / no-trip decision from the relay. An accurate and fast relaying decision can make the difference between the power system remaining stable or plummeting into cascade tripping leading to total ac failure. It is against this background that this paper presents a review of applications of DSP technique in the field of power system protective relaying. Simplistic models of power system give rise to extremely fast and simple algorithms but need extensive pre-processing. On the other hand complex models lead to slower decisions but give higher accuracy and may need very little pre-processing of the signal. Thus, the relaying engineer has to strike a balance between accuracy and speed.

This paper presents implementation of Differential Equation algorithm in MATLAB.

Key words : Distance protection, Digital signal processing, anti-aliasing.

1. Introduction

Power systems are becoming increasingly complex in nature. The modern society is dependent on the continuous availability of electric energy. The railways, banks, computer and telecom networks, continuous process industries, offices, hospitals etc. require uninterruptable energy for their proper functioning. Hence higher sensitivity, selectivity and speed are the requirements of a modern protective system[1]. The protection system must be highly reliable, fast and accurate. Rapid developments made in the field of electronics, digital signal processing and artificial intelligence techniques provide us with many powerful tools to evaluate the power system protection problems speedily and accurately. For protection of EHV (Extra High Voltage) lines which are basically tie-lines, distance protection has played a major role, since it has many advantages over over-current relaying[2]. With minor modification it also provides the basis for fault location and backup protection. The development of modern digital technology has resulted in fast, compact, reliable and efficient

relaying schemes for the protection of transmission lines.

2. Basics of Digital Signal Processing (DSP)

Digital signal processing is distinguished from other areas in computer science by the unique type of data it uses: signals. DSP is the mathematics, the algorithms and the techniques used to manipulate these signals after they have been converted into a digital form.

Sampling : The process by which the continuous waveforms may be represented as discrete values is referred to as sampling. In other words, sampling an input signal is a method of recording an instantaneous value of that signal. The rate at which sampling is performed is known as sampling frequency. The sampling frequency is not chosen arbitrarily and is a governing factor in the design of digital protective relay hardware.

Shannon's Sampling Theorem : It gives the relationship between the sampling frequency f_s and the frequency of the waveform to be sampled f_a [3]. It states:

In order to accurately represent an analog signal, the minimum sampling frequency must be equal to or greater than twice the highest frequency component of the original signal. This minimum sampling frequency is often referred to as Nyquist frequency or the Nyquist limit.

It is observed that higher the value of sampling frequency f_s above f_a, the larger is the component of the original sine wave in the sampled spectrum and more accurate the representation of the input signal.

2.1 Block Diagram of DSP Based Relay

Fig.1 shows the general hardware outline of a numeric (DSP based) protection relay. Relaying voltages at 110 V or 50 V and currents at 5 A or 1 A are first passed through isolation transformers. Since analog to digital conversion is usually performed on vol-

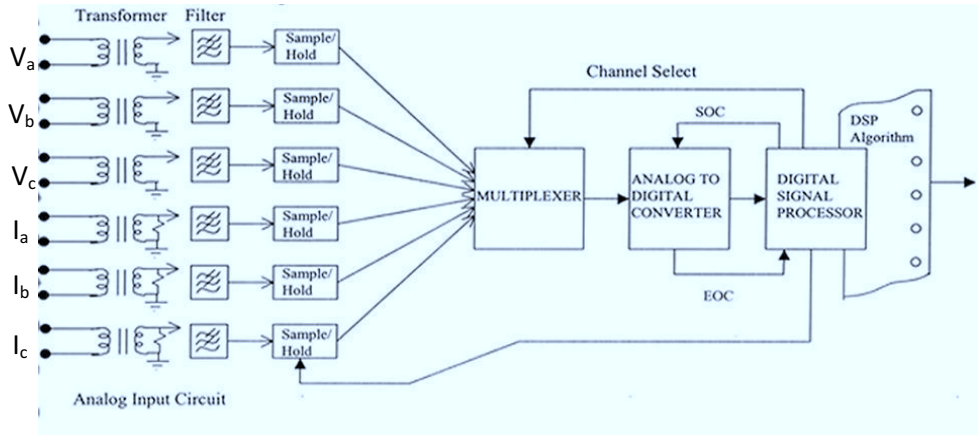

Fig 1. Hardware of a DSP based Relay

tages, the current signals are converted to respective voltage signals, by passing the current through a known low value resistance. All the signals are then filtered using anti-aliasing filters to remove any frequencies above 0.5 f_s. Since analog to digital converters (ADCs) are expensive, an analog MUX under DSP control is used sequentially to select the required signal into the ADC. Since the ADC takes a finite conversion time, it is necessary to hold the incoming signal for the duration of the conversion; this is achieved with the sample and hold amplifier. Having been converted by the ADC, the signals can now be manipulated by the DSP (Fig.1). The relaying program is located in the DSP whose output will be in the binary form. The output of the digital relay in addition to causing tripping of the desired circuit breakers can further be used for alarm, annunciation and communication purposes [4] .

2.2 Digital Filters : Need and Advantages

In signal processing, the function of a filter is to remove unwanted parts of the signal viz. random noise, or to extract useful parts of the signal, such as the components lying within a certain frequency range. A digital filter uses a digital processor to perform numerical calculations on sampled values of the signal. The processor may be a general purpose computer such as a PC, or a specialized DSP (Digital Signal Processor) chip.

A digital filter possesses the following advantages over an analog filter:

1) Programmable
2) Extremely stable with respect to time and temperature
3) Versatility
4) Can handle low frequency signals accurately
5) Simple and compact

3. Differential Equation Algorithm

Differential Equation Algorithm is widely used for computation of distance to fault in processor based relays. It is based on the solution of differential equation describing the relationship between the voltage and current at the relay location[5]. A single-phase line as shown in Fig.2 is assumed for developing the algorithm.

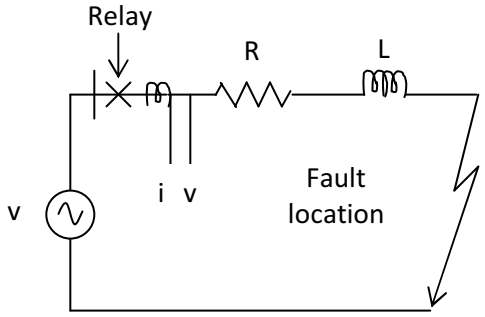

Fig 2. Transmission line model

The differential equation of the line is:

$$v = Ri + L\,(di/dt) \qquad \ldots (1)$$

The numerical solution of the above differential equation yields the value of R and L [6].

In real life the power system is complex hence complex pre-processing is needed. The relay can be

designed using complicated algorithm (Fourier Analysis and Walsh function based) too which may not need any pre-processing since the algorithm itself caters for the complexities of the real system[7].

4. Results and Discussion

For experimenting with the algorithm (using differentiation method) [8], values of R and X are assumed to be 1 Ω and 20 Ω respectively. V_{rms} is taken as 100 V. Since V, R, X are fixed, current magnitude and phase, both are fixed. The sampling rate is also selected and the samples are generated using mathematical relations. The differential equation algorithm is then applied to these values so as to extract the values of R and X (L). The observations are as recorded in Table 1 below.

Table 1. Variation in R and X wrt sampling rate

Sr. No.	Sampling Rate	Measured value of R (Ω)	Measured value of X (Ω)
1	10	1	21.379
2	30	1	20.14

It is found that the measured values of R and X are nearly the same as the assumed values. The plots of current vs ωt, resistance vs ωt and reactance vs ωt is as shown in Fig. 3.

5. Conclusion

Digital protection is certainly reliable and efficient protection scheme with very bright future prospects. The use of numerical techniques has opened up new methods of implementing protective relays. MATLAB based simulation was used to experiment with various algorithms. Efforts were

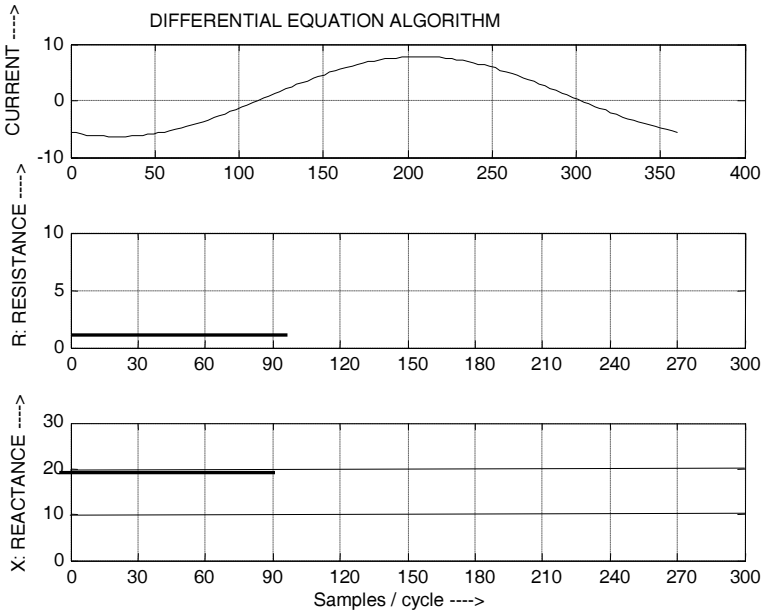

Fig 3. Differential Equation Algorithm

made to understand and appreciate the direction in which the protection technology is evolving. While designing the relay, high speed as well as high accuracy is needed which cannot be satisfied simultaneously. It can be concluded that the synergy created by affordable computing power and fast and cheap memories has provided unprecedented amount of freedom to the relaying engineer.

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Formulation and Development of Multi-Benefit Cream by using Mango Seed Oil

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Abstract

The main purpose of using cosmetic in modern society is for personal hygiene , to enhance, attractiveness through the use of makeup, to improve self esteem, to prevent ageing, to protect skin from ultra violet rays, pollutants and other environmental factors.

Now a day's many oil from plant sources are gaining increased popularity and it is challenging to the many researcher.

One of the most important oils used in cosmetic world is mango seed oil. It is used in various skin care, hair care and color cosmetics for its different beneficial properties like removal of tanning, protection from uv rays, acne prevention, blackhead removal, improving complexion, enhancing glow, anti-ageing property and hair smoothening property. Now a day's multi-benefit creams having more than one benefits for skin are very popular in market for their use.

Taking into account all these advantages, it was thought to study the properties of mango oil as ingredients of cosmetic product in skin cream. Hence, the present study is aimed to formulate and evaluate multi-benefit cream using mango oil giving multiple benefits.

Key words : anti-acne, blackhead removal, mango seed oil.

1. Introduction

Cosmetics are becoming more important in daily life as they are used regularly by increased number of people and large quantities are consumed each year. Now-a-days use of natural ingredients in cosmetic products is increasing. Actives and ingredients are obtained from natural sources more often including extraction from fruits, vegetables, leaves, roots etc. one of the most important oils used in cosmetic world is mango seed oil for its various beneficial properties i.e. blackhead removal, anti-acne, cleansing.

1.1 Skin

Externally every part of the body is covered with skin. It serves the body in so many ways that it is one of the largest organs of the body. It is good to have a smooth skin with fine pores. A healthy skin is slightly moist, soft, flexible & slightly acidic in reaction.

The skin is composed of three distinct layers:

a) The outer epidermis
b) Inner dermis &
c) Subcutaneous layer

1.1.1 Epidermis

Most superficial layer of the skin is composed of stratified epithelium which varies in thickness in different parts of the body. It is thickest on the palm of the hands and soles of the feet.

1.1.2 Dermis

It is tough and elastic composed of corneum fibres intellect with elastic fibress ruputure of elastic fibres occurs when the skin is over stretched resulting in permanent striae or stretch marks. It is the sensitive highly vascular part of the skin located just below the stratum basal of epidermis.

1.1.3 Subcutaneous tissue

Beneath the dermis there is a subcutaneous adipose tissue which contains many energy storing cells in and between connective tissues this is the deepest layer of the skin, composed primarily of fat. The subcutaneous layer manages the skin functions of excreting.[1]

1.2 Acne

Acne can be defined as a common inflammation pilosebaceous disease characterized by comedons, papules, pustules, inflamed nodules, and superficious pus filled cysts and in extreme cases canalizing and deep inflamed sometimes purulent sacs.

Mainly acne are found on the face then follows the neck, the upper part of chest, the shoulder and the back. Since these are the parts of the body where most of the sebaceous glands are found.

The bacteria cornebacerium acnes and staphylococcus albus or staphylococcus epidermis and staphylococcus aureus are almost commonly present in the pustularl contents.[2]

1.2.1 Causes of acne

To determine the best for acne, it is essential to understand the causes of acne which varies from individual to individual.

Several causes are interdependent, main factors outlined below:

1.2.2 Hyperactive sebaceous glands

The sebaceous glands produce sebum continuously. Sebum is secreted from the sebaceous gland duct and make its way to skin surface via the hair follicle pore. Testosterone promotes the sysnthesis, secretion and consequently the sebaceous glands become extremely active at puberty (age 10-16).

1.2.3 Hyper kurtosis

Hyper keratosis causes easily at the infundibulum of the hair follicle and the resulting thickened horny layer or horny material blocks or obstruct the hair follicle pore or duct of the sebaceous gland and when it becomes narrowed, the sebum cannot be normally excreted, resulting in obstruction

of hair infundibulum causing increase in bacterium acne. These bacilli product materials that induce inflammation and stimulate the epidermal cells in the infundibulum, resulting in further hyperkeratotic change.[3]

1.2.4 Development and formation of acne

As described in the causes of acne, over active secretion of the sebum coupled with hyper keratotis causes the hair pores to become narrow and block resulting in the first stage of acne called as comedo damages and affects the surroundings of the opening of the sebaceous glands. The result is an erythematous (red) papule. If this condition progresses, the horny materials and sebum blocking the hair infundibulum overflows into the dermis to form a large raised painfull pustule. When the large pustule subsequently heals, granulation often occurs and scars remain.[4]

1.3 Blackheads

Comedo is a clogged hair follicle (pore) in the skin. Keratin (skin debris) combines with oil to block the follicle. A comedo can be open (blackhead) or closed by skin (whitehead), and occur with or without acne. The word comedo comes from Latin to suggest the worm-like look of a blackhead that has been secreted.

Oxidation rather than poor hygiene or dirt causes blackheads to be black. Washing or scrubbing the skin too much could make it worse, by irritating the skin. Touching and picking at comedones might cause irritation and spread infection. It is not clear what effect shaving has on the development of comedones or acne.

A comedo may be open to the air (blackhead) or closed by skin (whitehead). Being open to the air causes oxidization, which turns it black. *Propionibacterium acnes* is the suspected infectious agent in acne. It can proliferate in sebum andcause inflamed pustules (pimples) characteristic of acne. Nodules are inflamed, painful deep bumps under the skin.

These skin problems are very common in today's life. Mango oil has a good skin beneficial properties i.e. anti-acne effect and blackhead removal properties. Therefore these both properties of mango oil can be utilized to formulate a multi-benefit cream, which can provide effect against acne and blackheads and help to maintain the healthy skin.[5]

1.3.1 Blackhead removal

Blackheads can be removed across an area with commercially available pore-cleansing strips or the more aggressive cyanoacrylate method used by dermatologists.

Squeezing blackheads and whiteheads can remove them, but it can also damage the skin. Doing so increases the risk of causing or transmitting infection and scarring, as well as potentially pushing any infection deeper into the skin. Comedone extractors are used with careful hygiene in beauty salons and by dermatologists, usually after

using steam or warm water.

Complementary medicine options for acne in general have not been shown to be effective in trials. These include Aloe vera, pyridoxine (vitamin B6), fruit-derived acids, kampo (Japanese herbal medicine), ayurvedic herbal treatments and acupuncture.

2. Methodology

2.1 Active: Mango Seed Oil

Trade name: mango kernel oil
Biological name: Mangifera indica, linn.
Family: Anacardiaceae

2.1.1 Extraction method

Cold pressed and solvent extraction. Mango oil is an oil fraction obtained during the processing of mango butter. Mango oil is extracted from the seed of the fruit of the Mangifera indica. The oil is solid below 20°c temperatures, but melts at above this temperature.

2.1.2 Chemical constituents

Mango seed oil consists of carbohydrates, fat, vitamin A, thiamin, niacin, vitamin E, vitamin k and some traces of metals like calcium, iron, magnesium, manganese , phosphorous, potassium, zinc, phytochemical compounds like alkaloids, saponins, tannins, flavanoids, resins, glycosides.[6]

Table 1 : Characteristics of oil[7]

Physical characteristic	Range
Color	Pale yellow
Refractive index at 40°c	1.4550-1.4570
peroxide value	1.73
Sap value	180-196
Acid value	27.5
Melting point	20.5°c
Specific gravity at 30°c	0.9991
Unsaponifiable matter	1.2% MAX

2.1.3. Properties

- It reduces blackheads, acne, dark spots.
- Mango oil has been used for its skin softening, soothing and protective properties.
- It is also used to restore flexibility and reduce degeneration of skin cells.
- It has protective effect against UV radiation.
- It has natural high oxidative ability and wound healing properties.

2.1.4 Cosmetic uses

- It can be used in creams, lotions, soaps.
- It is used in hair products.
- It can be used in lip preparations and other rigid stick formulations.
- It can be used in the treatment of wrinkles.
- It can be used in shaving creams.[8]

2.2 Formulation of cream base

Selection of the base for the incorporation of active is very important. Active should be compatible with the base.

Table 2. Formulation table with three different concentration of active

S.N	Ingredients	I (%)	II (%)	III (%)
	Phase A			
1.	Stearic acid	8g	8g	8g
2.	Cetyl alcohol	2g	2g	2g
3.	IPM	1ml	1ml	1ml
4.	Mineral oil	5ml	5ml	5ml
5.	Propyl paraben	0.01g	0.01g	0.01g
	Phase B			
6.	TEA	0.8ml	0.8ml	0.8ml
7.	Glycerine	8ml	8ml	8ml
8.	Propylene glycol	4ml	4ml	4ml
9.	Methyl paraben	0.01g	0.01g	0.01g
10.	Water	Upto100ml	Upto100ml	Upto100ml
	Phase C			
11.	Mango oil	15ml	20ml	25ml
	Phase D			
12.	Color	q.s	q.s	q.s

A simple base was selected to incorporate the active. The general cream can be of two types i.e. o/w or w/o. o/w cream base was selected.

2.3 Incorporation of active

The active was incorporated in three different concentrations i.e. 15%, 20%, 25% in a selected base.

2.4 Stability testing of finished product

All the three samples with different concentrations of mango oil were subjected to accelerated stability testing conditions and were kept at room temperature (27±2°c), oven (40±2°c), fridge (5±2°c) Fridge thaw test (-5 to +30°c). stability studies were carried out for 4 weeks.[9]

There was no significant change observed in color, odor, and Ph and viscosity of the product at room temperature, oven, fridge, fridge-thaw in all the products upto 4 weeks.

2.5 Evaluation of cream as per BIS

Cream was evaluated for pH, thermal stability and fatty matter as per BIS specification is given in table no.4[10]

2.6 Evaluation of antimicrobial activity of cream with mango oil

The cream with 15%, 20%, 25% concentrations were subjected to in vitro testing by using well diffusion method to evaluate antimicrobial activity.

2.6.1 Preparation and method

Sterilized apparatus and media were used for preparing 24 hours suspension for bacteria i.e. (P.acne & S.epidermidis) by using steriled distilled water. The media were melted by placing the boiling test tubes in water bath and the completely melted media with no lumps, were cooled to 45°c. The 10 ml culture suspension was then added to the substrate medium, mixed thoroughly and poured in sterile petridishes. The petridishes were kept on a plain surface allowed to solidify. After solidification 5 cups were cut on the plate by means of sterilized bore aseptically. 3 cups with Product containing 15%, 20%, 25% concentrations were filled and 2 cups with blank and control were filled. The petridishes were kept aside for 24hours. The zone of inhibition was observed on the next day.[11]

2.7 Subjective evaluation of cream

10 subjects of different age group between 18-24 yrs. were selected for blackheads removal test.

Procedure

1. Affected areas of subjects were cleaned properly.
2. Approx (1gm) quantity of cream was applied with gentle massage to the affected area.
3. It was then cleaned with a cotton pad
4. It was observed that most of the blackheads were removed.

Following observations is given below:

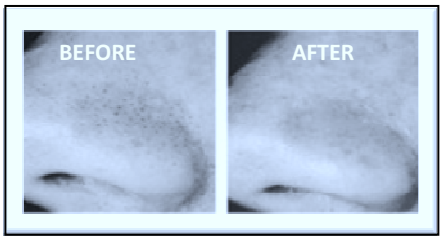

Fig 1.

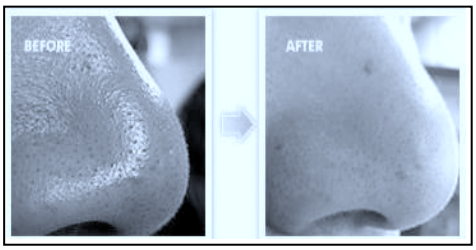

Fig 2.

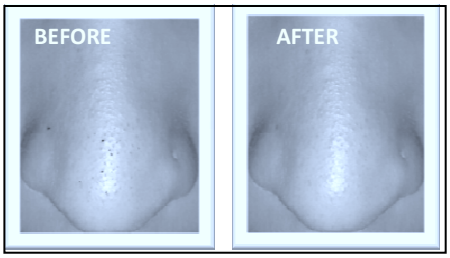

Fig 3.

3. Results

3.1 The preliminary phytochemical screening of mango oil is shown in the table 3.

Table 3. Phytochemical test[12]

S.N	PHYTOCHEMICALS	RESULT
1.	Carbohydrates	+
2.	Glycosides	+
3.	Saponins	+
4.	Resins	+
5.	Tannins	+
6.	Phenols	+
7.	Flavanoids	+
8.	Protein	-

3.2 Result of subjective evaluation of cream

The subjective evaluation of the product containing mango oil was done on group of 10 people having blackhead and age group between 18-24 years. So the blackhead removal effect of the product can be tested on them. Result was found to be positive. cream was accepted by most of the subjects and they were satisfied.

3.3 The cream was evaluated as per BIS of skin cream shown in table 4

Table 4. BIS test

SN	Tests	Standard	Result
1.	Ph	4-9	5.6
2.	Thermal stability	To pass the test	Pass
3.	Fatty con-tent, min.	5	15.29

3.4 Result of microbial evaluation of cream is as shown in table 5 and in Figs. 1, 2.

Fig 4. Zone of inhibition obtained by cream samples with active against P.acne

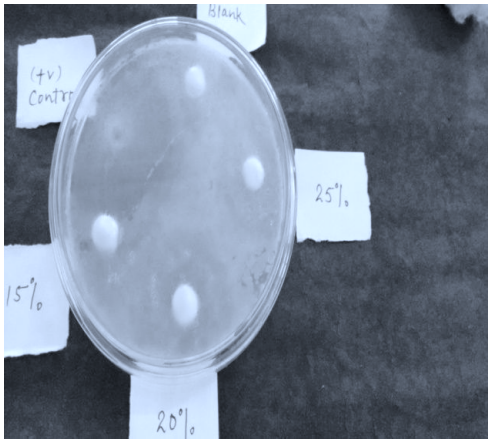

Fig 5. Zone of inhibition obtained by cream sample with active against S.epidermidis

Table 5 zone of inhibition of product containing mango oil

microorganism	Diameter of zone of inhibition				
	Blank	15%	20%	25%	Control(tet-racycline)
P.acne	10mm	20mm	33mm	30mm	45mm
S.epidermis	11mm	23mm	35mm	30mm	40mm

4. Conclusions

Mango oil is used for its various properties in cosmetics. It was thought to incorporate mango oil in a cream base giving multiple benefits i.e anti-acne, blackheads removal and cleansing. Mango oil consists of phytochemical constituents like tannins, saponins, flavanoids, resins, phenols etc. which are responsible for anti-acne and blackhead softening property therefore blackheads can be removed easily.

Different tests were performed for analysis of mango oil. Firstly, screening of phytochemical properties of mango oil was done. It shows positive result for flavanoids, saponins, phenols, resins, glycoside, tannins and carbohydrates. Physical and chemical tests of mango oil were performed which showed positive result.

Mango oil was incorporated into cream base with three different concentrations i.e 15%, 20%, 25% and theses cream bases were evaluated for their properties i.e. stability, anti-acne and blackhead removal.

Stability studies of finished product with mango oil were performed and it was found to be stable for 4 weeks duration. Testing of the finished product as per BIS standard no. IS6008:2004 was done and it was observed that product passes all the test.

Then product samples with three different concentrations were subjected to microbial testing(anti-acne) and products passed the test.

Subjective evaluation of the product was done for blackhead removal test and product was found to be effective and subjects were satisfied with the product as it easily removes the blackheads.

Mango oil was found to be stable with the product and it was giving positive results for various properties i.e. anti-acne and blackhead removal. Thus from the above studies it is concluded that the mango seed oil can be successfully incorporated in the cream base and it can be used as multi-benefit cream.

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Effect of Dietary Calcium and BMI on Bone Density in Adult Males

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Abstract

Osteoporosis is a disease that causes the bones to become thin and weak. Body mass index (BMI) or obesity index is a key index for relating a person's body weight to their height. In various past studies it was found that there was an association between body weight and BMI with BMD. Osteoporosis is a degenerative disease that starts slowly. For some it can take hold as early as childhood, in women it accelerates after menopause whereas in men it accelerates with abnormal bone composition or fracture.

A quantitative method was used, which was clearly identified in view of the specific objectives of the study. This study was an attempt to address one of the important public health problems which can be controlled if preventive measures are taken at an early stage.

Key words : BMI, BMD, Calcium intake, Osteopenia, Osteoporosis.

1. Introduction

Nutrition holds promise as a preventive measure in bone health especially in the development and maintenance of skeleton.[1] Human beings are sufficiently bone light to allow mobility. The pathological process of bone weakening is called "Osteoporosis" and it is a global public health problem. Osteoporosis is characterized by low bone mass and an increased risk of fracture.[2] In a study on Osteoporosis in Healthy South Indian Males and the Influence of Life Style Factors and Vitamin D Status on Bone Mineral Density, ambulatory south Indian men aged above 50 were recruited by cluster random sampling[3]. The physical activity, risk factors, BMD, vitamin D, and PTH was assessed. The number of people needing treatment was calculated, which included subjects with osteoporosis and osteopenia. A total of 252 men with a mean age of 58 years were studied. The prevalence of osteoporosis and osteopenia at any one site was 20% (50/252) and 58%, respectively. Vitamin D deficiency was seen in 53%. It was concluded that a significantly large proportion of south Indian men had osteoporosis and vitamin D deficiency. In another study, a total of 4,935 Korean population (2,309 men and 2,626 women) were analyzed in a

study based on association between dietary calcium and phosphorus intakes, dietary calcium/phosphorus ratio and bone mass.[4] Among various factors that affected bone health, not only dietary calcium and phosphorus intakes, but also the dietary calcium/phosphorus ratio could relate to bone health. In yet another study,[5] to explore and evaluate the correlation between the Body Mass Index (BMI) and Bone Mineral Density (BMD), to gauge the correlation between age and BMD and to investigate the effect of gender on BMD. BMD was determined in the femoral neck and lumbar (L2-L4) regions for 210 men and women with an average age of (57.41 ± 9.73) using dual energy X- ray absorptiometry (DEXA). Subsequently, 116 participants were determined to have osteopenia, and 94 participants had osteoporosis. The researchers analyzed the data by multiple regression and ANOVA models and found the highest percentages of osteopenia and osteoporosis, 48.3% and 44.7%, respectively in obese patients. Moreover, the correlation of the independent variables (age, gender and BMI) together and the dependent variable (BMD) was significant of osteoporosis only, but the correlation was not significant between BMD and each individual variables separately, compatible with a diagnosis of osteopenia and osteoporosis. Furthermore, the most effective variable on the BMD was the BMI, while the age was the most effective variable on the BMD of patients of osteoporosis when they were tested jointly. The BMD was influenced significantly by all independent variables (age, gender and BMI) together in the osteoporosis not in osteopenia, so all variables together are considered as risk factors of osteoporosis. However, this effect could not be implied in the osteopenia patients.

2. Materials and Methods

The study was conducted in Nagpur city to assess and compare the risky and preventive factors of Osteoporosis and the effect of Dietary calcium and BMI on Bone Density in males. A sample group of 300 Males (M), between >30 years and <70 years, willing to respond to the investigator, having no physical disabilities like being stone deaf, dumb, lame and not bedridden were selected by stratified random sampling method. The main objective of the study was to understand the intensity of prevalence of osteoporosis in 300 males in two age groups viz. 30-50 years and 50-70 years. The sample was further distinguished by gender, age and the BMI as shown below in Table 1.

Table 1. Sample Size

SN	BMI	30-50 Years I	50-70 Years II
1	Normal	112 (NIM)	070 (NIIM)
2	Underweight	031 (UIM)	027 (UIIM)
3	Overweight	038 (OIM)	041 (OIIM)
		181	**138**

N = Normal, U = Underweight, O = Overweight

2.1 Anthropometric Measurements

These physical measurements being another component of nutritional assessment, height and weight were measured and BMI was calculated using the standard formula.[6] Body mass index was calculated by dividing weight to square of height and subjects were categorized into four groups viz. Underweight (BMI < 18.5 kg/m^2), Normal (BMI = 18.50 - 24.99 kg/m^2), Overweight (BMI = 25 and above kg/m^2).

2.2 Bone mineral density (BMD) (gm/cm^2)

The BMD was measured at calcaneus (heel) by standardized QUS utilizing T-scores based on WHO criteria, which were obtained from the automated equipment. T score refers to the ratio between subject's BMD and that of young adult population of same sex and ethnicity. T-score of > -1 was taken as normal, between -1 and -2.5 osteopenic and < -2.5 as osteoporotic.

2.3 Calcium Intake

Dietary analysis is essential for a basic understanding of the nutrient intake of any individual. Since it evaluates intake and not the body's ability to utilize nutrients, it cannot be taken as an absolute indicator of adequate nutrition; however it is useful in obtaining presumptive evidence of dietary inadequacies. **Quantitative** nutritional assessment was carried and the calcium intake for each subject was calculated by using nutrient composition table on the basis of 24 hours recall method for three consecutive days. Calcium intake of diets were calculated using food composition tables.[7]

2.4 Statistical Analysis

The data was tabulated, Arithmetic mean and standard deviation were calculated for all parameters studied. Analysis was done using the standard statistical procedures. Pearson's Correlation coefficient was tested to know the correlation between Calcium intake and BMI and calcium intake and BMD Correlation refers to a technique used to measure the relationship between two or more variables. When two things are correlated, it means that they vary together. Positive correlation means that high scores on one are associated with high scores on the other, and that low scores on one are associated with low scores on the other. Negative correlation, on the other hand, means that high scores on the first thing are associated with low scores on the second. Negative correlation also means that low scores on the first are associated with high scores on the second.[8]

3. Results and Discussion

3.1 Correlation between Calcium Intake and BMI

It was seen that there was a positive correlation between BMI and Calcium Intake in the groups NIM Normal males (30- 50years), UIM, NIIM,UIIM (Normal and Underweight's 30-50 and 50-70 years) and OIIM **(Overweight males 50-70 years),** except for OIM **(Overweight males 30-50 years)** which was negatively correlated.

Table 2. Correlation Between Calcium, BMI and BMD

Group	CALCIUM mg ±SD	BMI Mean ±SD	p value Degree		BMD	p value Degree	
NIM	872.8 ±473.43	22.39 ±1.27	0.4214	+ve M	-0.52 ±0.95	0.3524	+ ve M
UIM	367.9 ±232.40	17.54 ±1.21	0.1561	+ve M	-0.8 ±1.00	-0.1648	-ve L
OIM	776.6 ±392.56	26.92 ±2.27	-0.0546	-ve L	-0.95 ±0.82	0.3617	+ ve M
NIIM	868.2 ±496.93	22.39 ±1.26	0.2536	+ve M	-0.88 ±0.94	0.3219	+ ve M
UIIM	431.8 ±281.31	17.74 ±0.96	0.0017	+ve L	-1.92 ±0.68	0.1054	+ ve L
OIIM	921.19 ±665.20	27.28 ±2.67	0.0931	+ve L	-1.12 ±0.88	0.2982	+ ve M

It was observed that in the normal weight males of both the age groups (30-50 and 50-70 years) BMI and Calcium intake were moderately correlated, where as in the underweight's of 30-50 years it was moderately correlated and in 50-70 years it was of low correlation. Even in overweight's of 50-70 years these variables were of low correlation. In OIM **(Overweight males 30-50 years)** these were negatively correlated. Thus it was seen that there was a positive correlation between the mean BMI and the mean Calcium Intake of respondents based on respective age and gender, in all ages except for overweight's which had negative correlation

3.2 Correlation between Calcium Intake and BMD

There was a positive correlation between BMD and Calcium intake. It was found that NIM Normal males 30-50 years), OIM, NIIM and OIIM i.e the normal and overweight males were moderately correlated – higher calcium intake led to higher BMD. Low correlation was found in UIIM i.e. underweight's (50-70 years) where as Negative correlation was found UIM (30-50 years). In case of UIM, there was a negative correlation. Thus it was seen that there was a positive correlation between the mean BMD and the Calcium Intake of respondents based on respective age and gender, except underweights. In a study[9] stated in Indian Journal of Medical Research more Calcium balance studies in subjects of different physiological states residing in different geographical regions of the world were required.

3.3 Correlation between BMI and BMD

Table 3. Correlation Between BMI and BMD (Males)

Group	BMI Mean +SD	BMD	p value	Degree
NIM	22.39 ±1.27	-0.52 ±0.95	0.0002	+ ve L
UIM	17.54 ±1.21	-0.8 ±1.00	- 0.0465	-ve L
OIM	26.92 ±2.27	-0.95 ±0.82	- 0.1691	-ve L
NIIM	22.39 ±1.26	-0.88 ±0.94	0.0805	+ ve L
UIIM	17.74 ±0.96	-1.92 ±0.68	0.1059	+ ve L
OIIM	27.28 ±2.67	-1.12 ±0.88	- 0.2966	-ve L

There was a positive but low correlation between the variables in NIM Normal males 30-50 years), NIIM and UIIM. Thus overall it was positive correlation i.e. higher BMI leads to higher BMD. However the relation between BMI and BMD was seen to be negatively correlated in the groups UIM OIM, and OIIM, i.e. higher BMI lead to lower BMD in these categories.

4. Conclusion

Thus it was seen that there was a positive correlation between the mean BMI and BMD of respondents based on respective age and gender, especially normal weights. As suggested in an earlier study[10] Lower weight should be carefully considered as a predisposing factor for bone loss and osteoporosis. Adequate dietary calcium and a physically active lifestyle could potentially improve the quality of life of people.

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Evaluation of Home Making and Health Practices of Tribal Women

(With reference to Sadak Arjuni Block, Gondia District)

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Abstract

The study aims at determining the Home making and Health practices of tribal women and their transition from traditional to modern ways.The study was undertaken in five villages of Sadak Arjuni block of Gondia district. 10 women <30 years of age and 10 women >30 years of age were selected purposely from each village making up a total of 100 respondents.The respondents were interviewed personally to collect information.

Tribal women are interested in change. They have largely adopted new practices and technology and are moving towards progress. They have started using modern methods of cooking and food storage practices. They are also using modern methods of family planning and are aware of the special needs of women in pregnancy.

Key words : Tribal women, health practices, home making practices.

1. Introduction

Tribal communities in India are economically and socially backward and mostly live in forests and hilly terrains isolated from the other elite communities.

Tribes have their own way of living and different socio-cultural and eco-geographical settings. Lack of proper education and health facilities, faulty feeding habits, certain irrational belief systems and special tribal chores are likely to aggravate their health and nutritional status. Tribal women, in general, enjoy better status in the society than the general caste people because they exercise decisive role in the family (mother work), society (social work) and economy (other work) in India. However, the ideological devaluation of women's contribution and reorientation of gender and sex have brought about concomitant drastic changes in the status of women and their empowerment in different dimensions of deprivation and exploitation, and imposed restrictions on daily folkchores of life. In few communities, a definite decline has been observed

threatening their very existence. This decline may not be due to low level of fertility but rather high level of mortality and illogical health practices. The success of dynamic tribal development is dependent on various factors like improved literacy rate, sustainable socio-economic status, women's empowerment, better health care and other human resource indicators. It is much desirable to make reproductive health care accessible and affordable, extending basic amenities, empowering women and enhancing their employment opportunities, and providing the transport and communication facilities, but traditional practices and taboos have been considered as barriers to their success.[1]

Curbing population growth is not a goal; it is only a mean to development. The success of dynamic tribal development is dependent on various factors like improved literacy rate, socio-economic status, women's empowerment, better health care and other human resource indicators. It is much desirable to make reproductive health care accessible and affordable to all, as of increasing the provision and outreach of primary and secondary education, extending basic amenities, empowering women and enhancing their employment opportunities, and providing the transport and communication facilities.

The tribal situation in India presents a varied and complex picture and poses peculiar problems of economic development. Demographically speaking, there are some 250 scheduled tribes with several sub groups, speaking some 100 languages. Tribals have been brought under the fifth and sixth schedules of the Indian Constitution[2].

Various planned efforts have been undertaken for the development of tribals but the pace of development was very slow, investment and other protective measures were also inadequate. The tribals practice traditional culture, rituals customs and systems of medicine within their ecosystem.[3] Recent years have witnessed an increasing concern about the health of tribal mothers and children. Health planners have constantly been struggling for improving maternal and child health services of tribals. Modern systems of medicine, increased awareness of hygiene and sanitation and proper nutrition have been their major goals.

Though social change is taking place in different directions and degrees in tribal societies in India, there seems to be some resistance to change by the tribals. Protectionistic policies, uneven development and tribal exploitation, forest policy, displacement and alienation, educational policy and political socialization have promoted primordial loyalties among the tribals, making them apprehensive of the rest of India.

Since tribals are gradually shifting from traditional ways to modernity in their means of living in areas like home making, health, occupation, transport, communication and the like, the study was undertaken to find the

aspects of change, specially in areas of homemaking and health.

The study the following objectives:

- To study the social and economic attributes of tribal women
- To find out the traditional practices among tribal women regarding selected homemaking and health aspects.
- To find the modern practices among tribal women regarding selected homemaking and health practices.
- To understand the problems tribal women face, if any, in shifting from traditional to modern practices.

1.1 Purpose of the study

The study throws light on the practices that are conducive for development in order to create a platform for development planners to construct effective programmes for tribal women welfare.

1.2 Hypothesis

Modern practices have replaced traditional practices among tribal women due to tribal development programmes.

2. Review of literature

The lack of better levels of educational attainments and requisite modern skills is an inhibiting factor for further social transformation and entry into modern occupational structure. The increasing trends of occupational deviations from traditional/parent conferred occupations, inter and intragenerational occupational mobility and the exchange mobility occurance over four generations support the fact that the yerkulas have undergone transformation.[4]

Primary Health Centres / dispensaries exist in tribal areas with allopathic, ayurvedic and homoeopathic practitioners but tribal people seek the help of these centres as the last resort. The important aspect of maternal and child care is of poor nature. No extra care is taken by women during pregnancy.[5]

Literacy was high among the Angami and Garo tribes to whom Christian educational institutions were available several decades ago while it was low among the rest. However today, tribals have started gaining access to inputs such as education and administrative jobs which has changed their situations.[6]

3. Research methodology

3.1 Selection of area

Sadak Arjuni block of Gondia District was the area of study. From the block, five sub areas viz: Khajari, Dauwwa, Parsodi, Mokashitola and Chirchadi were the sub areas selected for the study. These areas were purposely selected as these villages had maximum concentration of tribal population in the district.

3.2 Selection of sample

From each of the selected villages, 10 women below 30 years and 10 women above 30 years of age were selected purposely making up a total of

100 respondents. Data on modern aspects of homemaking and health were collected from 50 respondents below 30 years of age. 50 respondents above 30 years of age were selected to collect data on traditional methods of homemaking and health aspects.

3.3 Selection of method

The popular survey was used to collect information from the sample.

3.4 Selection of tool

Interview schedule was selected as the tool to collect data from the respondents as there is greater flexibility in this method to restructure questions as and when needed.

4. Results

After the collection of data, the results were interpreted and is as follows:

- Maximum respondents <30 years of age were from 26 - 30 years (34%). Respondents >30 years of age were from 36 – 40 years (11%).
- 100% respondents <30 years were found to be literate.
- Maximum respondents had farming as their main occupation.
- Maximum respondents earned Rs. 4000/- to Rs. 5000/- per year.
- All the selected villages had primary schools in their areas.
- Maximum respondents had membership in savings groups(90%<30 and 74%>30 years of age).10% (<30 years)and 12%(>30 years) were members of mahila mandals respectively.
- Maximum respondents take allopathic medicines for treatments.(100% <30 years of age and 47% >30 years of age).
- 100% respondents prefer family planning methods at present, whereas they did not use any family planning methods traditionally.
- Maximum respondents were not given adequate status in their families.(82%<30 & 100% >30).
- Maximum respondents of >30 years are influenced by superstitions (70%).
- All the respondents <30 years and 92% >30 years opined that 18 to 20 years is the ideal age of marriage for girls. Regarding widow remarriage, there was no provision for it but presently widows can remarry if they wish.
- All the respondents <30 years of age and 76% of respondents >30 years of age have accepted modern practices and technology introduced in their societies.
- Maternal mortality has declined in their society.
- Modern methods of cooking like cooking gas and bio-gas are being used for by the respondents.
- 100% respondents feel that education is an important factor in their life.

Table 1. Changes in Food & Cooking Practices of Tribals

n = 50

Sr. No	Responses	<30 years %	>30 years %
1.	Modern cooking methods	100	100
2.	Modern storage methods	100	100
3.	Food restrictions	82	76

The above table indicates that except for restrictions on food, all the respondents have adopted modern methods of cooking and storage methods for grains. Respondents <30 years of age (82%) and >30 years of age (76%) opined that women still have restrictions imposed on them due to religious bindings.

- In contrast to earlier practices of food storage, modern methods of storage with chemicals is being used at present.
- All the respondents have adequate drinking water facilities and they practice proper hygiene in their houses.
- Maximum respondents have toilets in their houses.

Most of the respondents <30 years of age have accepted and adopted non traditional practices and 70% of them have faced difficulties in practicing traditional practices.

Table 2. Responses Regarding Practices

n = 50

Sr No	Responses	<30years %	>30years %
1.	Practising non-traditional practices	100	78
2.	Difficulties in practicing traditional practices	70	12
3.	Acceptance of modern practices	100	76

The hypotheses framed for the study is accepted as maximum respondents have replaced traditional practices with modern practices in the fields of home making and health aspects.

5. Conclusion

Tribal women of the study area have adopted new practices and technology and are moving towards progress. They are traditional minded basically but are inclined towards modern ways of home making and health practices.

Women have started using modern ways of cooking, food storage and modern methods of family planning.

The study concludes that tribal women have adopted modern home making and health practices.

6. Suggestions

- Focus to be more on education.

- Technical and professional training to be given to people in agriculture.
- Focus on supplementary income.
- Motivation needed to socialize.
- Social and health organizations to be set up for rapid progress, welfare and development which is supported by the study "Socio Cultural charecteristics And Health Seeking behavior".[7]
- More awareness and participation in Community development projects.
- Involment of tribals in Government and Non-government organizations.

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Socio-Economic Status of People who have Adopted Low Cost Home and Farm Technology - A Study Conducted in Nagpur District

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Abstract

A person is recognized in the society according to his status. Education, experience, motivation, orientation are all the factors which will increase his social & economical conditions. The study was conducted in various regions of Nagpur District. 300 samples was selected by Purposive Sampling technique on Random basis. Data was gathered by the tool Interview Schedule through Survey method and analysed by percentages. Respondents had higher socio-economic conditions because they had adopted low cost home & farm technology.

Key words : Higher socio-economic status, low cost technology.

1. Introduction

Status is said to be the position of a person or family which they hold in the society in which they live in. A person is recognized in the society according to his/her status. The treatment and honour which one receives is also because of his status. Status of a person is usually seen or calculated on the basis of their involvement in the social, cultural and religious gatherings and occasions; the way he helps and shows his interest in other people around him. Similarly, there are few set behaviours and patterns which every individual has to follow according to the society. There are some roles and responsibilities of every individual towards the society. Every society has few laws and rules which is applicable to every individuals living in it.

In the same way, economic position of a person is usually seen through his economic resources and assets. The amount of money which a family spent on luxury and comfort also depends upon the earning capacity of all the members of that family. A person is usually judged in the society through his income levels which will categorize him in high income, middle income or low income levels.

It is also seen that a person's social and cultural involvement, his education and social participation plays a very important role in determining his position in the society. Other than this, a person's source of information in

gaining and acquiring knowledge plays an equal important role in overall molding his personality in the society in which he lives in.

Every person wants name, fame, recognition, prestige and honour from the society. The recognition is usually gained by the social and economical position of any individual. As it is correctly inferred, "vegetable growers with higher education, higher social participation, higher socio-economic status, higher extension participation, higher annual income, higher mass media exposure and having subsidiary occupation along with farming had high extent of knowledge about environmental hazards"[1] As seen from the above inference it is clear that more the amount of involvement of a person in various social and cultural activities more amount of knowledge is gained. The same way, "increased education, annual income, experience in farming, social participation, source of information, economic motivation, risk orientation and knowledge helped in increasing the adoption of the improved strawberry production practices"[2]. From the above conclusion we can say that education, experience, motivation, orientation are all the factors which lead a person to analyze and evaluate what is right and correct for him which will increase his social and economical status.

Urbanization and Modernization are bringing people together. This is making the urban society larger and larger day-by-day and the rural areas are shrinking. The same way people are working outside their houses and earning through various income generation activities. As science is developing with each passing day new inventions and technologies are being launched for the benefit of the people. These technologies reduce labour of a person, make him less tired, bring out more work from them which in turn will increase productivity.

"Technology in a limited aspect has been understood as applying scientific knowledge to industrial process. In a broader sense, technology means application of science to practical aim of life. It refers to the transformation of scientific laws into machines, tools, mechanical devices, instruments, innovations procedure and techniques to attain tangible ends or manipulative environment for practical purposes."[3]

As it can be seen from the above definition of technology that it is the application of science to practical aim of life which means, that each and every technology that is being invented is in some way or the other benefit a human being and can be used in various ways in reducing stress and labour.

From the time we get up in the morning to the time we go back to sleep we are surrounded with technology. Human being has become addicted to technology. It plays a very important role in every individual's life, be it in the field of education, health services, agriculture, communication or defense. Technology has changed the quality of life. It has made our life simpler, time is saved, labour

is saved, we have started living our life with ease and comfort after technological inventions. Technology has also boosted the economy of the entire nation by providing various employment opportunities to thousands of people. The need of technology is very well explained through the following paragraph, "Imagine life without the evolution of technology. What kind of life do we have right now? Technology has been a part of our life and it is one of the key ingredients for the survival of mankind to living in the fast phase environment. The development of new technology helps people save lives. It helps people make work easier and makes the world a better place to live in."[4] It can therefore be concluded from the above paragraph that technology is leading mankind and has become a very crucial part of the entire human race. It has also made our life simpler and easier.

There are various technologies which are launched for the development and welfare of the rural people in India. Some of them are as follows:

- Food and agro-based technology
- Drinking water technology
- Environment and sanitation technology
- Cultivation and processing
- Technologies related to cottage and small scale industries
- Rural power supply
- Health and hygiene
- Technologies dealing with waste matter
- Technologies creating energy
- Technologies improving transportation and communication

1.1 Objectives

The present study had the following objectives:

1. To find out the economic condition of the respondents.
2. To find out the social conditions of the respondents.
3. To study the impact of technologies in improving the socio-economic status of the respondents.

1.2 Need and importance of the study

The basic need of the study was to find out the socio-economic status of people who have adopted low cost home & farm technology. The result of this study will be helpful to sociologists, economist and other community development planners to assist them to incorporate the findings in their future plans.

2. Methodology

The present study was conducted in various rural areas of **Nagpur District** covering East, West, North and South regions. **Purposive Sampling** was used in which only those people who have adopted low cost home & farm technology were selected. Lahiri Method of **Random Sampling** was used to select the samples which gave each and every unit of the population and equal opportunity of getting selected. **Survey Method** was used to collect data which comprises of **300**

samples from around Nagpur District. **Interview Schedule** was the tool used to collect data; which was further analyzed with the help of **Percentages**.

3. Results

Table 1. Characteristics of Respondents: (N=300)

SN	Characteristics	Number	Percent
	Age		
1	Less than 20 Years	36	12%
2	21-30 Years	93	31%
3	31-40 Years	81	27%
4	41-50Years	60	20%
5	51 and Above	30	10%
	Religion		
1	Hindu	258	86%
2	Muslim	21	7%
3	Christian	6	2%
4	Others	15	5%
	Marital Status		
1	Unmarried	54	18%
2	Married	216	72%
3	Widow	21	7%
4	Divorcee	9	3%
	Type of Family		
1	Nuclear Family	54	18%
2	Joint Family	177	59%
3	Extended Family	48	16%
4	Broken Family	21	7%
	Type of House		
1	Temporary House	12	4%
2	Permanent House	288	96%

It is revealed from Table 1 that 31% of respondents belonged to 21-30 years of age followed by 31-40 years (27%). Maximum respondents (86%) were Hindus. Seventy two percent of respondents were married. A maximum of 59% of respondents had joint family while 96% of them stay in permanent houses.

Table 2. Economic Condition of the Respondents (N=300)

Sr. No.	Economic Condition	Number	Percent
	Educational Qualification		
1	Illiterate	24	8%
2	S. S. C.	78	26%
3	H. S. S. C.	135	45%
4	Graduate and above	63	21%
	Occupation		
1	Home makers	45	15%
2	Farming	141	47%
3	Labour	63	21%
4	Skilled labour	51	17%
	Monthly Income (in Rupees)		
1	Less than 2000/-	12	4%
2	2001-4000/-	15	5%
3	4001-6000/-	78	26%
4	6001 and above	195	65%

From the above Table 2, it is seen that a maximum of 45% of respondents have completed their education till H. S. S. C. Forty seven percent of respondents have farming as their oc-

cupation. Maximum of 65 % of respondents obtained monthly income of Rs. 6001/- and above.

Table 3. Facilities Provided to Respondents (N=300)

Sr. No.	Facilities	Available Percent	Non Available Percent
1	Electric Supply	97%	3%
2	Water Supply	72%	28%
3	Toilet Facility	95%	5%
4	Medical Facility	89%	11%

It is seen from the above table 3 that 97% of respondents have electricity available to them, 72% of them have water supply available to them, a maximum of 95 % have toilet facilities in their houses, while 89% of respondents have various medical facilities available to them by the Government.

Table 4. Social Condition of Respondents (N=300)

Sr. No.	Social Organisation	Available Percent	Unavailable percent
1	Small Scale Industry	82%	18%
2	Mahila Mandal	73%	27%
3	Anganwadi	79%	21%
4	Gram Panchayat	91%	9%
5	Others	39%	61%

As revealed in Table 4 the social condition of the respondents is analysed through the type of social organizations existing in a particular area. There are small scale industries like Agarbatti making, Diya making, Papad & Pickle making available in their areas for 82% of respondents.A maximum of 73% &79% of respondents respectively have opined that they have active Mahila Mandal & Anganwadi in their areas. Ninety one percent respondents have Gram Panchayats available in their, While 39% of respondents have various NGOs working in their areas.

4. Conclusion

Maximum respondents were found to be of 21-30 years of age, were Hindu and were married. Most of them stayed in joint families and had permanent houses. Many of the respondents have completed their education till 12^{th} standard; their main occupation was farming & earned a monthly income more than Rs. 6000/-. Maximum respondents enjoyed various facilities like electric supply, water connection, toilet & medical facilities. Many respondents have various social organizations available in their area like small scale industries, Mahila Mandal, Anganwadi & Gram Panchayat.

It can be inferred that higher socio-economic conditions were observed among respondents who have adopted low cost home & farm technology.

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Adopter Categories of Tribals in Adopting Biogas Technology
(A Study undertaken in Kachewani village of Gondia district in Maharashtra State)

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Abstract

India is home to a large number of tribes with population of about 70 million. Due to welfare programmes tribal communities made themselves conscious about their own elans elistments.

They have become more vibrant with new expectations and are moving out of their isolation on to paths of development in terms of adoption of new farm and home technology.

Adoption is the acceptance and the continued use of an innovation

There are five established adopter categories such as Innovator, Early Adopters, Early majority, late majority and laggards.

Adoption of innovation refers to the decision to apply an innovation and to continue to use it.

The study concludes that the respondents belong conveniently concluded that they belong to the 'innovator category'.

Key words : innovation, adopter categories, Tribes.

1. Introduction

Tribes and Tribal Culture

India is home to a large number of tribes with population of about 70 million. In terms of geographical distribution, about 55% of tribals live in Central India, 28% in West, 12% in North-East India, 4% in South India and 1% elsewhere. Each tribal communities are rich in their culture folk tales, folk songs & folk stories. They have an institution called GOTUL where the tribal children and youth are imparted training in their culture. The objectives of GOTUL is to train tribal people to become sincere, productive and useful members of their community.

Tribal people are found in almost all the states of our country. Currently there are between 258 and 540 scheduled tribe communities. The strength of these communities varies from 31 people of Jarwa tribe to over 7 million Gonds. Thus the Gonds are a big tribal community whereas the small communities comprising less than 1000

people include the Andomanese, Onge, Oraon, Munda, Mina, Khond, Saora.

Due to welfare programmes tribal communities also made themselves conscious about their own élans enlistments. Now tribals are engaged in struggle for survival. They seek identity, autonomy, equality and empowerment. They became more vibrant with new expectation, they are moving out of their isolation to participate in a struggle in all institutions as equals, in context of tribal culture.

They have become more vibrant with new expectations and are moving out of their isolation on to paths of development in terms of adoption of new farm and home technology.

Innovation : An innovation is an idea, practice, or object that is perceived as new by an individual or other unit of adoption. It matters little, so far as human behaviour is concerned, whether or not an idea is 'Objectively' new as measured by the lapse of time since its first use or discovery.

Adoption : Adoption means that a person does something differently than what they had previously performed. The key to adoption is that the person must perceive the idea behaviour, or product as new or innovation it is through this that diffusion is possible.

Adoption of Innovation : Adoption of an innovation is an act which involves thought, decisions and action. In the process of adoption of an innovation an individual passes mainly through five stages viz. awareness, interest, evaluation, trial and adoption

Adopter Categories

There are five established adopter categories, and while the majority of the general population tends to fall in the middle categories, it is still necessary to understand the characteristics of the target population, when promoting an innovation. There are different adopter categories.

Innovator – These are people who want to be the first to try the innovation. They are venturesome and interested in new ideas.

Early Adopters – These are people who represent opinion leaders. They enjoy leadership roles, and embrace change and opportunities.

Early Majority – These people are rarely leaders but they do adopt new ideas before the average person.

Late Majority – These people are skeptical of change and will only adopt an innovation after it has been tried by the majority.

Laggards – These people are bound by tradition and very conservative. They are very skeptical of change and are the hardest group to bring on board.

Adoptional Behaviour

The importance of farmers adoption of new agricultural technology has long been of interest to agricultural extension and economists. Several parameters have been identified as influencing the adoption behaviour of

farmers from qualitative and quantitative models for the exploration of the subject. Social scientists investigating farmers' adoption behaviour has accumulated considerable evidence showing that demographic variables technology, technology characteristics, information sources knowledge, awareness attitude and group influence affect adoption behaviour.

Tribal Characteristics

The important characteristics of a tribal are Definite Territory, Common Language, Blood Relationship, Endogamy, Common name, Political organization, etc.

Adoption of Technology

Technology adoption means different things to different people. Viewing technology adoption as a consistent process is the key to enabling hesitant users to successfully adopt & technology.

Technology adoption is important because it is vehicle that allows most people to participate in rapidly changing world where technology has become central to our lives. Individuals who won't or can't adopt will increasingly limit their ability to participate fully in the financial & convenience benefits associated with technology.

Biogas Technology

Biogas originates from biogenic material; it is a type of bio-fuel which primarily consists of methane and carbon dioxide. Biogas can be used as low-cost fuel for heating, cooking and power generation. Biogas can also be compressed like natural gas, and we can also use it to run motor vehicles. Being a renewable source of energy, biogas qualifies for subsidizes in some parts of the world. Biogas offers a highly cost-effective and decentralized energy product option at community and household levels.

1.1 Objectives of the Study

The study is being undertaken with the following objectives.

1. To study educational, social and economic-status of the selected respondent.
2. To identify the sources of motivation that led the respondents to adopt Technologies.
3. To study the problems and difficulties faced by the tribal women in adopting new technologies.

1.2 Significance

The government and NGOs efforts in the field of tribal development have in many cases not been successful, The reason being lack of knowledge of the adoptional behaviors of tribal's.

The study will primarily focus on adoptional factors that will help the policy makers to consider them while introducing biogas technology to the tribals.

The conclusions drawn from the study can be of importance to policy makers in the government, NGO and university departments engaged in the field of tribal development.

1.3 Hypothesis

Higher socio economic and educational level and awareness and easy access to technology are the adoptional factors of innovations among tribal woman.

1.4 Limitations

- The researcher is not able to conduct the study in a larger area due to paucity of funds and time.
- The result of the study may apply to area with similar characteristics.
- The study is limited to the selected village alone.
- The study is confined to the sample with age group of 25-45 years.
- Though the tool has been prepared through constant revision, yet there always is scope for refinement.

2. Review of Literature

There were positive association between the adoption & the number of livestock, age & land.[1] This research study helps to make policy option and to understand the factors behind the adoption of biogas technology.

The success of biogas programme and decision making is purely based on financial and economic analysis.[2]

The trainees of Krishi Vigyan Kendra, Karnataka had high level of knowledge (100%), whereas in case of non-trainees, 52% high level, 44% medium level and only 4% with low level of knowledge.[3]

3. Methodology

Kachewani village in Tirora Block of Gondia district in Maharashtra State was selected for this study. This area was purposefully selected by the researcher as the researcher is a native of the same area. This creates additional support with the respondents.

Kachewani village is located in Tirora taluka of Gondia District, in Maharashtra State with total 541 families. The Kachewani village has population of 2,358 of which 1179 are males while 1179 are females as per population census of 2011.

15 women from Kanchewani village were randomly selected.

Survey method was used for collection of information which defines the purpose of a given social situation.

Interview schedule is one of the traditional tools of data collection. For the survey interview schedule was used as a tool to collect data. In interview method one gets information in a face-to-face situation.

The data was collected and analyzed with the help of percentage method.

4. Results

The respondents ranged from 20 to 50 years with 66.66% respondent from 41 to 50 years of age.

Among the total sample, majority of the respondents have been found to be Graduates i.e. 58.33%, the next category Middle School less which is

Table 1. Socio-Economic status of Respondents N = 15

S.No.	Particulars		
1.	**Age of respondents**		
		No.of respondents	Percent
	20-30	3	20
	31-40	2	13.33
	41-50	10	66.66
	51-60	00	00
	61-70	--	--
	71-80	--	--
	Total	15	100
2.	**Educational level of the respondents**		
	Illiterate	--	--
	Primary	03	20
	Middle School	04	26.66
	Graduate	08	58.33
	Post Graduate	--	--
	TOTAL	15	100
3.	**Monthly income of respondents**		
	Upto 3000	--	--
	3001 – 5000	1	6.66
	5001 – 7000	6	40
	7001 – 9000	3	20
	Above 9000	5	33.33
	Total	15	100
4.	**Participation of respondents in social events/festivals in community**		
	Haldi Kumkum	10	66.66
	Mahila Bachat Gat	1	6.66
	Mahila Melava	1	-
	Mahila Bhajan Mandal	2	13.33
5	**Live stock particulars of respondents**		
	Cow	15	100
	Buffaloes	15	100
	Goats	10	66
	Horses	--	--
	Bullocks	15	100
	Hen	10	66

26.66% and 20% are educated upto primary level. All the respondents in the area were educated.

Maximum of respondents earn an income of rupees 5001 to 7000 (40%), whereas 33.33% of them have income in the range of above Rs.9000/- and 20% are found in Rs.7001-9000 income level and 6% only have Rs.3001-5000 as their monthly income.

Maximum respondent (66.66%) observed Haldi Kumkum, a social get together of women. Mahila Bhajan Mandals and Jagran Mandals are also social occasions where they come together.

100% respondents had cows, buffaloes and bullocks as livestock.

Table 2. Responses Regarding Discussions to Adopt Technology

N=15

Responses	No. of respondent	Percent
Family Members	10	66.66
Friends	5	33.33
Extension Worker	20	100

**Multiple responses*

All the respondents consulted extension workers. The respondents (66.66%) have had discussions with family members and 33.33% with friends regarding the technology.

Table 3. Motivation for Technology

N=15

Responses	No. of respondent	Percent
Extension Worker	10	66.66
Media	--	--
Experts	--	--
Experienced neighbours	5	33.33
Total	15	100

Maximum respondents (66.66%) received guidance from extension workers and 33.33% from experienced neighbours. Media experts did not play any role in guiding respondents about the technology.

Table 4. Difficulties in Accepting this Technology N=15

Difficulties	No.of Respondents	Percent
Negative Thoughts	15	100
Incomplete guidance to people	05	33.33
Lack of Knowledge	10	66.66

**Multiple responses*

5. Conclusion

Majority of the respondents were educated and maximum respondents earned an income of rupees 5000 to 7000 per month and regarding exposure to technology they received guidance from extension worker and experienced neighbours.

Since most of the respondents were active socially and economically

strong, it can be conveniently concluded that they belong to the 'innovator category'.

5.1 Inference

Majority of the respondents of the study, "**Adopter Categories of Tribals in Adopting Biogas Technology"** were from the innovator category because they exhibited characteristics of innovators like belonging to a higher socio-economic status, being educated, willingness to adopt new ideas and first to develop new ideas.

5.2 Hypothesis

The hypothesis, "higher socio economic and educational level and awareness and easy access to technology are the adoption factors of innovations among tribal women" is found to be true in the study and therefore stands **accepted.**

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Problem Behaviour in Social Skills in Children With and Without Siblings

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Abstract

The paper asserts to determine if there is any difference in the problem behaviour in social skills in children with siblings and without siblings .The effective sample of the study comprised of 150 children ; which included 75 with siblings and 75 without siblings in the age group of 8 – 12 years .The educational level was from 4th to 6th standard . The problem behaviour in social skills was assessed by administering " Social Skills Problem Behaviour checklist by Madhu Mathur and Saroj Aurora . Mean , S D & C R were used for interpreting the data . Results of the study revealed that in the areas of presentation skills, interaction skills, communication skills, and social integration skills there were no significant difference among the groups and in area of " attitude towards other children" and attitude towards adult " there were significant difference between children with siblings and children without siblings .

Key words : Social skills, children with siblings , children without siblings.

1. Introduction

A collection of behaviour that are remarkably effective for attracting and keeping the attention (and attachment) of adults is termed as social skills of an individual[1].

Social skills are those skills that allow appropriate social interaction with others. They are based on a set of verbal and nonverbal behaviour standards, derived from one's specific society or culture. Social skill development begins at birth with the first parent-child interactions. As children grow, they learn to socialize through experiences with others in addition to their parents. Some skills include the knowledge of appropriate behaviour in different situations, the formation of reciprocal relationships, the regulation of one's emotions etc. Social skills play a critical role in a child's development and continue throughout life, facilitating acceptance and successful personal relationships[2].

Social skills and the ability to assert are essential for children and adolescents. They are confronted daily with situations that call for social interaction. When children do not function competently in interactive situations, they are noticed, singled out, or suffer social ostracism and humiliation. social skills are concerned with making and maintaining social relationships.

Social skill is a "Degree in which

a person can communicate with others in a way that satisfies their own rights, needs, pleasures and obligations with a reasonable degree without damaging the rights, needs, pleasures or similar obligations of another person and in which they share with others a free and open interchange".

Social skill involves the knowledge of what to do and how to display one's self, as well as manifesting behavioural control and flexibility.

Types of Social Skills

There are number of social skills. But Trower (1980) considered two important social skills which are as follows :

1. Self-awareness skills :
2. Interpersonal skills : These skills are of three types -
   a. Communication skills
   b. Role taking skills
   c. Problem-solving skills

Problem Behaviour

This refers to some normal pattern of behaviour during every period of development which is regarded as "problem" behaviour by parents, teachers and adults, as they don't conform to the adult standards. Such behaviours for example: are taking things that belong to others, saying lies etc. These so called Problem behaviours arise because of the adjustment the child must make to new demands and new environment conditions. The greater the demand and the greater the changes in the environment the more adjustment problem the child will encounter. Behaviour, which interferes with the child's adjustment to life and makes him unhappy now and later, can be called problem behaviour. It fluctuates with age, social setting and cultural background. Not just that, in the same individual, it may vary from time to time depending on the intensity and effect of stress which is now considered essential to cause abnormal behaviour in an essentially normal child. Problem behaviour is behaviour that makes life difficult and unsatisfactory for the child, not for the parents.

Sibling Relationship

Playmates and friends play a highly significant role in children's development, but so too can brothers and sisters. Sibling relationships are an important type of "horizontal" relationship. It also plays a distinct role in socialization, different from those with parents or peers. Sociability is influenced by sibling relationship; children who spend time with siblings tend to become sociable earlier than those who spend all their time at home alone (without any sibling). Siblings share common memories and experiences since childhood. A sister or a brother is a little bit of childhood that can never be lost Siblings are often the ones who know us in and out and extremely well.

Normally, children's social skills develop as a result of their interactions with others. These interactions allow children to learn about themselves and others, and furthermore aids in cogni-

tive and emotional development. Several studies show that siblings play a positive role in this development.[3] Children benefit from siblings in that they allow for early socialization that can begin to prepare them for more successful peer interactions. Other studies have found that siblings contribute to children's development of social skills and their understanding of relationships because they are together all of the time and as a result carry over to peer relationships.

Sibling benefits decrease as the number of siblings' increases. It was seen that those with one or two siblings displayed an increased benefit in the development of interpersonal skills but found that greater siblings showed no difference in social ability over "only" children.[4]

1.1 Statement of problem

Now a day's children do not have time to play outside with peer group or classmate , and attend social groupings and gathering with their parents. Children spend most of their time attending long school hours , completing homework, attending coaching classes, watching television, playing on computer and smart phones. This leads to lack of socialization or social skills. But siblings in the family may change the scenario. The child with a sibling may find opportunities to interact with sibling and therefore may learn few social skills . But a child without siblings may lose out on this opportunity also, children without siblings spend most of their time at home alone which makes them feel lonely, shy to talk to strangers and so may lack social skills. Therefore an attempt is made to study the problem behaviour in social skills of children with and without siblings .

1.2 Significance of the study

Acquisition of social skills is of prime necessity in todays globalized world .

Social skills helps the individual in establishing his opinion and also command respect. A number of studies have pointed out the important role of siblings in development of social skills. Hence it is important and desirable to probe into the social skills development of children.

1.3 Literature Review

The Role of Sibling Relationships in the Development of Social Abilities. Siblings are important in developing social abilities. A pencil-and–paper survey measuring social abilities was given to 50 participants, 20 females and 29 males. An Analysis of Variance (ANOVA) performed. Several correlation tests found significant results that the closer participants felt towards their siblings, the closer they felt towards their friends. Participants did not feel significantly closer to their friends when they saw and communicated less with their siblings. This study support the idea that sibling relationships help develop social abilities , friendships, and ultimately, life satisfaction.[5]

The study "Influence of siblings

on the development of social skills in children who are deaf or hard of hearing" showed statistically significant improvement in social skills of the disabled.[6]

1.4 Objectives

The study was guided by the following objectives :

1. To study the problem behaviour in social skills of children with siblings .
2. To study the problem behaviour in social skills of children without siblings .
3. To compare the problem behaviour in social skills among the children with siblings and without siblings .

2. Materials and Methods

2.1 Sample

The sampling method used was stratified random sampling. The efective sample of the study comprised of 150 children which included 75 with siblings(35 boys and 40 girls) and 75 without siblings(39 boys and 36 girls) in the age group of 8-12 years. The educational level was from 3rd to 6th standard.

2.2 Tools Used

Social skills Problem behaviour checklist by Madhu Mathur and Saroj Aurora[7] was used.

2.3 Statistical Treatment

The data was analyzed using descriptive and inferential statistics.

3. Results and Discussion

Table 1. Mean and SD of the six areas of social skills problem behaviour in children with siblings and without siblings.

Areas		WS	Wos
A - Presentation skills	M	13.16	12.76
	SD	2.17	2.14
B - Interaction Skills	M	9.41	9.41
	SD	1.63	1.55
C - Communication Skills	M	22.16	22.85
	SD	3.57	3.8
D - Social Integration	M	18.52	18.81
	SD	3.74	3.72
E - Attitude towards other children	M	13.41	14.89
	SD	2.67	2.73
F - Attitude towards adults	M	19.4	21.44
	SD	3.13	3.27
TOTAL	M	96.06	100.16
	SD	16.91	17.21

Examination of the above table 1 suggests that children with siblings have a total mean value of 96.06 (with an associated SD of 16.91) and the total value of children without siblings is 100.16 (with an associated SD of 17.21) The children without siblings have higher mean value than children with siblings. It indicates that higher the value, higher is social skills problem behaviour. This suggests children with siblings are better in social skills than children without siblings. However only on the basis of descriptive statistic it is not possible to infere confidently whether there is a real difference amongst the two classified groups. Hence the data was subjected to critical ratio.

Table 2. Mean SD & CR value for six areas of Social Skills

Areas	Off Spring	Mean	SD	CR Value
A – Presentation skills	WS	13.16	2.17	1.14
	WOS	1.14	2.14	
B - Interaction Skills	WS	9.41	1.63	0
	WOS	9.41	1.53	
C - Communication Skills	WS	22.16	3.57	1.15
	WOS	22.85	3.80	
D - Social Integration	WS	18.52	3.67	0.48
	WOS	18.81	3.72	
E - Attitude towards other children	WS	13.41	2.67	3.36**
	WOS	14.89	2.73	
F - Attitude towards adults	WS	19.40	3.13	3.92**
	WOS	21.44	3.27	
TOTAL	WS	96.06	16.84	
	WOS	88.54	17.19	

From Table 2 it is seen that for presentation skills CR value is 1.14 which is non significant at 0.01 level. This means that with respect to presentation skills children with siblings and without siblings do not differ significantly and the difference seen can be attributed to chance factor. Similary for interaction skills the obtained CR value is 0 which is non significant at 0.01 level. Hence it can be inferred that the two groups do not differ significantly. As is evident from table 2 communication skills and social integration skills also failed to yield significant CR value. Thus it can be asserted that the two groups i.e. with siblings and without siblings do not differ significantly with respect to communication skills and social integration skills. This can be explained in terms as todays parents are conscious and aware of parenting techniques and what type of environment to be provided to children. They enrole their children in personality development classes as also communication classes. Children are sent to adventure camps etc.

All these type of activities help children in building social skills.

The next area of social skills assessed was attitude towards other children.

This skill refers to prominent patterns of behaviour towards other children. This area yielded a CR value of 3.36 which is significant at 0.01 level. From the mean values it is evident that children with siblings have shown significantly better attitude towards other children than children without siblings. Children with siblings are happy in the company of other children as they have identified the pattern of behaviour with other children. They are better able to

form friendships and maintain them. So they are better accepted by the peer group than children without siblings.

The last area analysed was 'attitude towards adults'. The CR value 3.92 is found to be significant at 0.01 level. This skill is concerned with the childs dealings with authority figures. Children with siblings behave as per the social group norms. These children act appropriately with the adults with respect to their age. The parents tell the younger siblings to respect the elder siblings and this behaviour gets generalized to adults also. With siblings around the child gets many opportunities to work on development of social skills.

4. Conclusion

The findings of the present study from statistical treatment and analysis of the data suggest the following :

- In Attitude towards other children, children with siblings are superior to children without siblings.
- In Attitude towards adults, children with siblings are superior to children without siblings.
- There is no significant difference in the other areas of social skills problem behaviour between children with and without siblings.

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Effect of Stress Relaxation Techniques and Stress Management Strategies and Programs on Social Development of 12th Class Students - An Experimental Study

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Abstract

Stress is a way, in which person's body responds to challenges and gets ready to face them with attention, energy and strength. Stress gets a person ready for action and the motivation to get things done. But there can be problems when stress is greater than the person's ability to cope.

Stress in teenagers is pretty common, so recognizing stress and learning how to reduce it, are important life skills for teenagers.

This research paper focuses on the effect of stress relaxation technique, stress management strategies and programs on social development of adolescent, and guidelines to manage stress successfully.

Key words : Stress relaxation techniques (SRT), Stress management strategies (SMS), Adolescent.

1. Introduction

Stress is an omnipresent part of life. It is simply a reaction to a stimulus that disturbs our physical or mental health[1]. Stress is body's way of responding to any kind of demand or threat. When a person feels threatened, the nervous system of that person respond by releasing a flood of stress hormones, including adrenaline and cortisol, which rose the body for emergency action.

When working properly, stress helps a person to stay focused, energetic and alert. But beyond comfort zone, stress stops being helpful and can start causing major damage to person's mind and body. Autonomic nervous system often does a poor job of distinguishing between daily stressors and life-threatening events[2].

Now a day's student's life is full of challenges and competitions. Teen stress is an important issue. The early teen years are marked by rapid changes-physical, cognitive, and emotional. Young people also face changing relationships with peer, new demands at school, family tensions, and safety issues in communities. The ways in which teens cope with these stressors can have significant short-and long-term consequences on their physical, social and emotional health.

During adolescence, boys and girls try to expand their circle. Establish close relationship with friends and belongs to a peer group, associated with as many clubs and societies as possible in institutional framework. They give and expect strong loyalties.

Adolescence is the period of social adjustment. In this period, the individuals learn many lessons in social relationships. It has been seen that individuals differ from one another in social behavior. Differences between cultural and economic status are responsible in developing the varying social behavior pattern in child. Inferiority and superiority complexes are barriers to the social development of child.

The stress response prepares a person to react quickly and perform well under pressure. It can cause problems, when it overreacts or goes on for too long. Long term stressful situation can produce numerous social, emotional and physical disorders like loneliness, aggressiveness, depression, anxiety, heart attacks, stroke, hyper tension, immune system disturbances.

School is the top source of stress for teens specially 12 class students, peer pressure, teacher's, and parent's pressure, getting into a good college or deciding what to do after 12th class. Students of 12th class who appear for board examination have significantly greater stress than other students.

1.1 Effect of stress on body

Stress that continues without relief can lead to a condition called distress - -a negative stress reaction. Distress can lead to physical, emotional and social symptoms like headache, stomachache, back pain, high blood pressure, rapid

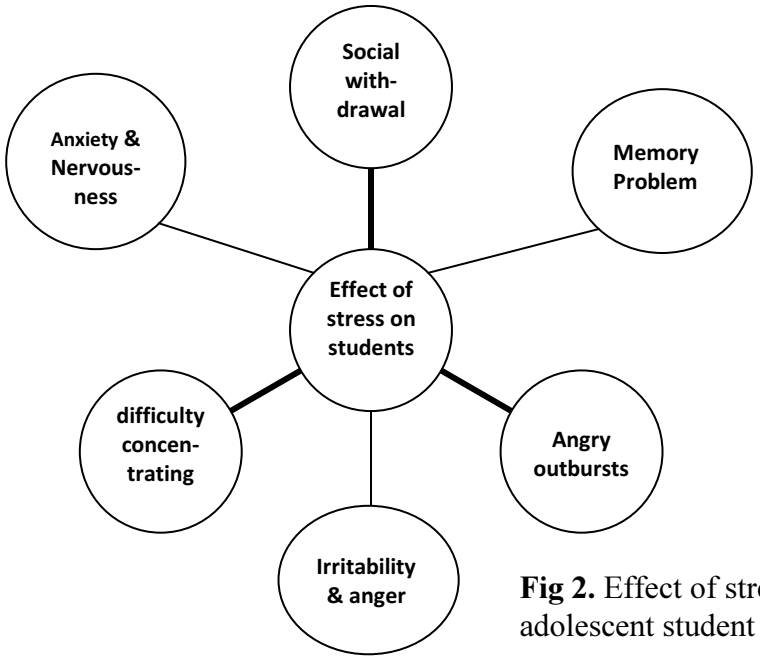

Fig 2. Effect of stress on adolescent student

breathing, infertility, depression, mood swing etc.

1.2 Effect of stress on students

Students life is full of stressful events such as difficult relationship, carrier decision, getting admission in best college, parents expectations, demanding work etc, Chronic stress can have significant impact on students body as well as thoughts, feelings and behavior[3]. Effect of stress on student's life is shown in the following figure (fig. 2)

1.3 Effect of stress on social behavior

Stress often affect social life, retract from social interactions, became irritable and hostile[4]. Effect of stress on the social behavior of the students is referred in the following figure (fig. 3).

1.4 Need and significance of problem

Stress is a natural and important part of life, but too much of it can be overwhelming and even damaging to health. Every person react to stress in different ways. Although stress can help to be more alert and prepared when needed, it can also cause emotional and physical distress. Under a lot of stress, person might experience feelings such as frustration, sadness, anger, and nervousness.

As a teenager, there is a lot to be stressed about. At school, there are heavy homeworkloads, tests that require lot of studying, college applications and sometimes even changing schools. Stressful issues at home can include parents' expectations, loss of loved ones, and dealing with siblings.

Teen must also face bodily changes during puberty, peer pressure, and changes in relationships. With so much going on, it's easy to get overwhelmed. When stress builds up and isn't dealt with in a healthy way, it can diminish a person's energy, compromise the immune system, and lead to

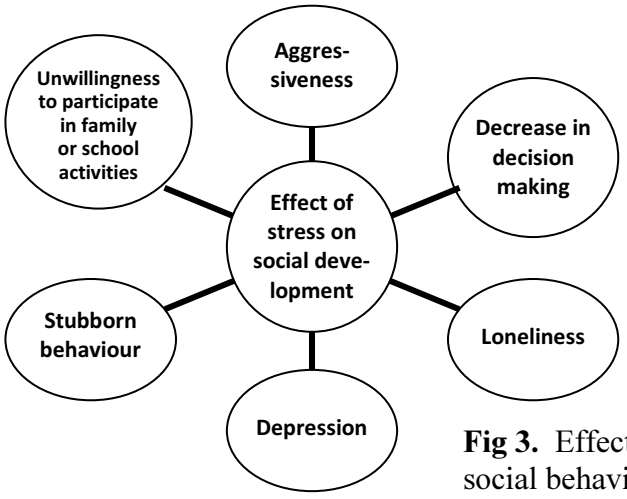

Fig 3. Effect of stress on social behavior of students

anxiety problems. To avoid these issues, it's important to deal with stress in positive way.

After informal discussion with students, parents and teachers researcher found that 12th class students are under long term stress and they become aggressive for small reasons, disrespecting parents and teachers, often show anger outburst, attempt suicide, etc. Researcher also found some studies, which support the researcher's observations. These things motivated the researcher to do research work on reduction of stress on students and improve their social and emotional behavior. For these reasons, researcher selected this topic for research work.

Stress relaxation techniques and stress management strategies help students to overcome stress and anxiety. This also help students to improve their life by identifying the root causes of stress and overcome it by simple ways, as well as improve social and emotional health.

1.5 Statement of the problem

Effect of stress relaxation techniques and stress management strategies and programs on, social development of 12th class students - An experimental study

1.6 Definition of the terms used -

1. Stress

Lazarus defined stress as, “Stress refers to a very broad class of problems differentiated from other problem areas because it deals with any demands which tax the system, whatever it is, a physiological system, a social system, or a psychological system, and the response of that system."[5]

2. Social development

Sorenson says that, “by social growth and development we mean the increasing ability to get along well with oneself and others.”[6]

3. Stress Management

Stress management means managing stress by reacting to the stress causing factors and changing it so that stress get reduced.

4. Stress Relaxation Techniques

The techniques which help in counter balancing between sympathetic nervous system and parasympathetic nervous system are called relaxation techniques.

1.7 Objective

To study the effect of stress relaxation techniques and stress management strategies and programs on the, social development of the 12th class students.

1.8 Hypothesis

There is no significant difference between the scores of pre and post tests of social development, of the 12th class students of rural area.

2. Research design

Single group design. (Presented in Table 1)

An experiment will be conducted on randomly selected 60 students of

Table 1. Single group research design

Pre Test	Stress relaxation techniques[7]	Stress management strategies[8]	Programs	Post test
Social Development	1. Self understanding. 2. Self Management. 3. Conflict resolution. 4. Positive Attitude. 5.Self talk. 6.Breathing exercise . 7.Meditation. 8.Exercise. 9.Altering your Diet. 10. Taking more Regular and Effective rest.	1. Avoid unnecessary stress and events make excessive demands. 2. Alter the situation. 3. Adapt the stressor. 4. Accept the things you can't change. 5. Make time for fun and relaxation. 6. Adapt a healthy life style. 7. Avoid extreme reactions. 8. Set realistic goals. 9. Manage how stress affects you. 10. Get enough sleep. 11. Set priorities. 12. Do something for others. 13. Work off stress. 14. Learn how to best relax yourself. 15. Look around. 16. Avoid self medication or escape.	1. Counseling program. 2. Guidance program. 3. Guest lecture. 4. Elocution. 5. Skit. 6. Role play. 7. Games.	Social Development .

12th class from randomly selected school, from Nagpur district.

1. Sample

Researcher selected 60 students randomly for study, in which 30boys and 30 girls are included.

Procedure

2.1 phase-I: Selection of the sample and orientation of the students to the experiment.

2.2 Phase-II: Pretest

The following test was administered on 60 students.

Social maturity scale - Dr. Nalini Rao.

2.3 Phase-III: Experimental treatment

The treatment given in experimental design (table 1) were given to the students.

2.4 Phase-IV: Posttest

The tests given in pre test, were again administered on 60 students after the experimental treatment

3. Data analysis

From the mean and standard deviation of pre and post test scores ob-

tained by boys and girls for factor social development, it is evident that, a notable variation is there between pre and post test means. The values are presented in the table no. 2 and 3.

Table 2. Showing Mean, SD and 't' values for correlated sample of boys

Conditions	N	Mean	SD	't' value
Pre-test	0	226.1	17.45	2.05*
Post-test	0	241.06	17.48	

The difference of 14.96 between the mean of pre and post scores is an effect of SRT and SMS program.

The 't' value of the boys for social maturity was 2.05, this value is significant at 0.05 level of significance.

Table 3. Showing Mean, SD and 't' values for correlated sample of girls

Conditions	N	Mean	SD	't' value
Pre-test	30	218.66	20.48	3.66**
Post-test	30	246.36	19.30	

The difference of 27.7 between the mean of pre and post scores is an effect of SRT and SMS program.

The 't' value of the girls for social maturity was 3.66, this value is significant at 0.01 level of significance.

Thus the given hypothesis was rejected, as stress relaxation techniques (SRT), stress management strategies (SMS) and programs did help in reduction of stress and social maturity of boys and girls.

4. Conclusions

According to the analysis and interpretation of data, following conclusions are drawn -

Social development of 12th class boys and girls are improved due to SRT & SMS programs, as 't' values of boys and girls are significant at 0.05 and 0.01 level of significance.

5. Suggestions

Use of relaxation techniques and stress management strategies reduces stress of students so that they can handle the stress in a positive way and improve their social development.

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Color Preference of Silk Fabric Dyed with Natural Dyes Extracted from the Plants Containing Latex

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Abstract

The use of synthetic dyes causes environmental pollution as majority of these dyes are toxic and non-biodegradable. Natural dyes on the other hand have proved to be eco-friendly, biodegradable and highly compatible with the environment. Consequently dyes derived from natural sources have emerged as important alternatives to synthetic dues.

The present study focused on dyeing of silk fabric with the natural dyes extracted from the plants containing latex. Pre mordanting was done with natural vegetable and metallic mordants, and method of dyeing of silk with the barks was standardized, determining the optimum dyeing conditions namely dye material concentration, dye material extraction time, mordant concentration and mordanting method. These samples were evaluated /ranked for color preference.

Key words : Natural dyes, eco-friendly, bio-degradable, Latex, Mordant, Optimum, aqueous Extraction, non-mutagenic.

1. Introduction

Color has been playing a dominant role in the life of human being from the time immemorial and is one of the elements of nature that made the human living more aesthetic and fascinating in the world. They are supposed to be associated with emotions, human qualities, season, festivals and passion in our life. The art of dyeing is as old as our civilization, for thousands of years human being have been used natural colors for dyeing.[1]

Natural dyeing is a technique to dye the textiles with the colors extracted from natural sources like plants, animals and minerals etc. Natural dyeing and printing have been used for centuries but the disadvantages of being limited in colors and inferior in color fastness and durability properties. However they are eco-friendly, biodegradable and non-carcinogenic in comparison to synthetic dyes,[2] synthetic dyes have a variety of colors according to the demand of consumer but these dyes are environmentally unfriendly because their production and application requires strong acids, alkalis, solvents, toxic amines, high temperatures and heavy metal catalysts[3],

these dyes are toxic and hazardous in nature. Disposal of hazardous wastes of synthetic dyes is a major environmental and economical challenge.

Natural dyes are non-toxic and do not create environmental problem due to their bio-degradable nature.[4] Demand of natural dyes is increasing continuously as their production and application does not require strong acids and alkalis[5], in addition of their environmental friendly nature many natural dyes have antiallergic and deodorizing properties. The major advantages of natural dyes are that they are non-mutagenic, colors are soothing to human eyes, and hence dyeing with natural dyes can be a way of value addition to textile product

Research efforts by individuals and organizations and information through various seminar, symposiums, workshops and research articles have now revealed various natural dye sources. plenty of information about different sources of natural dyes is now available in the literature.[6]

Natural dyes are derived from natural resources and based upon their source of origin, mainly fall into following three categories :-

- Plant /vegetable origin
- Insect / animal origin
- Mineral origin

Plant : Colorants derived from root leaf bark trunk fruits and flowers of plant.

Insect : Natural substances obtained from either exudation or dried bodies of insects, some of examples of animal dye sources include the urine of cow, the camel dung ,shellfish.

Mineral : Oxides of iron,tin and antimony have been used along with vegetable or insect dyes to obtained the desired shade of fabrics , salts like copper and iron sulphate are used as auxiliaries in the dyeing/printing of fabrics.[7]

Plant latex is a complex emulsion in which protein, alkaloids, starches, sugars, oils, tannins, resins and gums are found. In most plants latex is white, some have yellow or orange also.

For the present study six latex containing plants were selected namely:

1. Achras sapota(family Sapotaceae)– Bark
2. Artocarpus heterophyllus(family – Moraceae) – Bark
3. Ficus religiosa (family – Moraceae) – Bark
4. Ficus benghalensis(family – Moraceae) – Bark
5. Carica papaya (family – Caricaceae) – Leaves
6. Ficus carica (family – Moraceae) – Bark

Mordant plays an important role in the process of dyeing with natural dyes in producing different colors and improving colors fastness, and considered as an integral part of the natural dyeing, As textile fibers do not have much affinity for the majority of the natural

dyes, hence these are subjected to an additional step known as mordanting. Mordants are the substances that have affinity for both textile fibers and dyes, thus they act as a link between the fiber and dyestuff. Those dyes that do not have affinity for a fiber can be applied by using mordants .In the case of dyes having affinity for the fiber, the use of mordents increases the fastness properties,which also improves the colour.There are three types of mordants ,namely Metal Salts or Metallic mordants, Oil mordants, and Tannins.[8]

In the present study three natural vegetables- tannin- containing substances/mordants i.e Myrobolan (TerminaliaChebula.), Pomegranate peel and Babool bark. And three natural metallic mordants i.e. Alum ($Al_2(SO_4)$), Ferrous Sulphate ($FeSO_4$) and Copper Sulphate ($CuSO_4$) were selected.

Mordanting is the treatment of textile fabrics with metallic salts or other complex forming agents which bind the natural mordantable dye on to textile fiber. The percentage of chemicals and the weight of the material to be dyed are very important. The details of chemicals to be used for various mordants with their quantity fixed temperature is to be maintained, duration of time and procedure to be followed after mordanting and before dyeing have to be followed strictly There are three ways of mordanting. Mordants and dyes may be applied in three ways, are as follows;

- Pre-mordanting, where the mordant is applied first followed by dyeing.
- Post-mordanting, where the dyeing is done first and then mordanting is carried out.
- Simultaneous mordanting ,where mordanting and dye are mixed together and applied.[9]

For the present study pre mordanting method was applied for mordanting the samples

The dyes extracted from selected latex containing plants were applied on the silk fabric with the help of selected mordants and these dyed samples were further visually evaluated by the group of college girls for the color preferences.

The objectives of the work were to study the use of extraction of latex containing plants in natural dyeing technique and to evaluate/rank naturally dyed (dyes extracted from latex containing plants) silk samples for their color preferences.

2. Material and Methods.

2.1. Materials

2.1.1. Source

The barks of Achras Sapota, Artocarpus heterphyllus, ficus carica, ficus benghalensis and ficus religiosa and leaves of carica papaya were collected from nearby areas.

2.1.2. Substrate

Bleached degummed mulberry silk fabric was used for dyeing.

2.1.3. Mordants

Myrobolan (Terminalia Chebula) was used for pre-treatment and pomegranate peel and babool bark were used as natural vegetable mordants. Alum (Al_2 (SO_4)), Ferrous Sulphate ($FeSO_4$) and Copper Sulphate ($CuSO_4$) were used as metallic mordants for the study.

2.2 Experimental Method

2.2.1 Dye Extraction

Barks and leaves of plants were collected washed and shadow dried. These dye sources were cut into small pieces and soaked overnight in plain water separately.The percentage dye material was 60 to 80% (owf).The aqueous extraction was conducted with material to liquor ratio 1:50. The extractions were carried out at temperature 100^0 C for 60 min. after cooling; filtrates were collected respectively for further processing.

2.2.2 Pre Treatment

The weighed myrobolan (Terminalia Chebula), powder i.e. 40% (owf) was soaked overnight in sufficient plain water, filtered and boiled next morning. After cooling, weighed silk samples were treated in myrobolan filtrate for 40-45 min with continuous handling.material to liquor ratio was 1:50, samples were removed and drip dried, ready to next process i.e. mordanting.

2.2.3 Pre Mordanting

The weighed (owf) vegetable mordants were soaked overnight in sufficient amount of plain water separately, boiled and filtered it, the pretreated silk sample were mordanted (boiled) in the filtrate, at 80°C and for 40-50 min. The material to liquor ratio was 1:20, maintained throughout the process, continuous boiling and stirring was done, samples were removed and washed properly & drip dried for next process.

The metallic mordants were boiled in hot water to get dissolved properly then filtered it and pretreated silk sample were treated with this filtrate at room temperature for 40-45 min, removed and washed thoroughly, drip dried (in shadow), ready for next process.

2.2.4 Dyeing Procedure

The pretreated and pre mordanted silk samples were dyed with dyes extracted from selected plants maintaining material to liquor ratio i.e. 1:20 throughout dyeing, dyeing was carried out at 80°c and continued for 40-45 min with continuous stirring. To optimizing the color, Samples were removed, washed, and shadow dried, p^H was observed throughout dyeingprocess

2.2.5 After Treatment i.e. Soaping

The dyed silk samples were introduced to after treatment for fixing of dye, soaping was done with all samples, ½ ml/liter liquid soap was used. Sufficient water level and temperature 40°c was maintained. Each and every sample was treated in soap solution for

15 min at room temperature, removed and washed with normal water, drip dried in shadow.

2.2.6. Evaluation

There is a growing need for the non-toxic method of coloration for health sensitive applications, In today's fashio era women are more health conscious as well as they are environmental and ecology conscious too. They choose eye appealing colors for their day to day apparels, by the time they urged for unique, uncommon, soothing and soft shades also. The use of natural dyes may be beneficial with regard to environmental impact and sustainability,especially if dyes are extracted from waste products.

Keeping this in mind the study was carried out. As the fabric dyed with vegetable natural dyes will fulfill new eras demands, the samples were introduced to the group of 25 college going girls, to evaluate /to rank for the color preferences as per their choices.

3. Result & Discussion

The color preference of silk fabric, premordented with different mordants and dyed with dyes extracted from plants containing latex, obtained in this study were evaluated and the Mean and standard Deviation of the preferences for color is given in table-1.

Above table shows preference score for colors derived from latex containing plants and mordants .

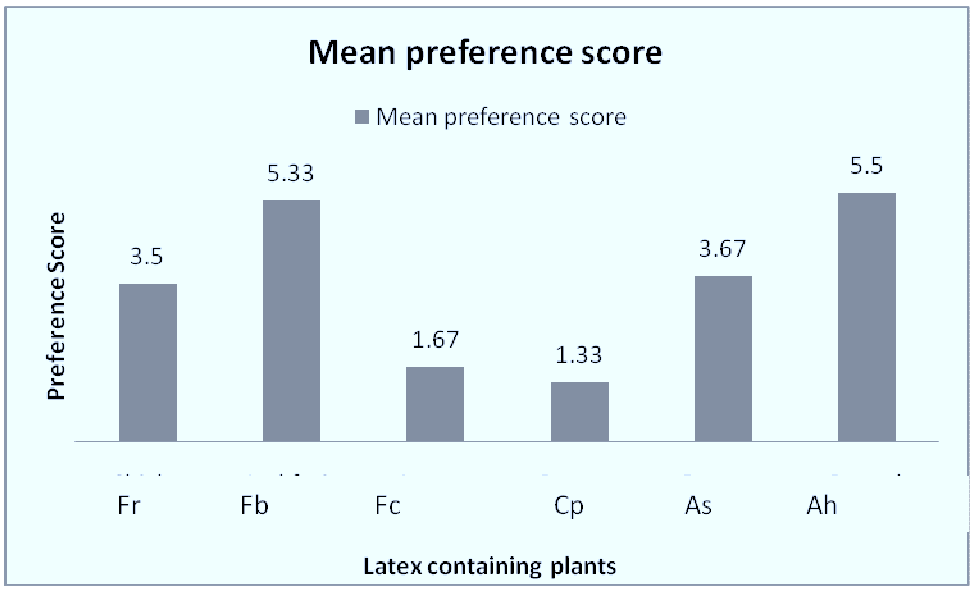
From the result, it was observed that color from Artocarpus heterophyllus showed best preference with highest score i.e. 5.5, Ficus benghalensis scored second with 5.33, Achras sapota scored 3rd with score 3.67, Ficus religiosa scored 3.5 which is also satisfactory and preferred 4thwhere as ficus carica and carica papaya scored 1.67 and 1.33 ranked 5th& 6th respectively.

The chart shows the graphical representation of Mean preference score.

Table 1. Mean and SD Scores of Preference

S.No.	Dyes from Latex Containing plants	Mean preference score	SD of preference score	Ranks
1	Ficus religiosa	3.5	0.55	IV
2	Ficus benghalensis	5.33	0.82	II
3	Ficus carica	1.67	0.52	V
4	Carica papaya	1.33	0.52	VI
5	Achras sapota	3.67	0.82	III
6	Artocarpus heterophyllus	5.5	0.55	I

Graph 1 :



4. Conclusion

From the above study it is observed that, the color obtained from Artoecarpus heterophyllus, Ficu sbenghalensis and Achras sapota with mordant copper sulphate preferred best and the color obtained from Artoecarpus heterophyllus, Ficus benghalensis and Achras sapota with mordant Alum preferred better than the other combinations of mordant & dyes.

From the results observed, it is recommended that these dyes can have good scope for textile dyeing, printing and painting.

5. Acknowledgement

We are very grateful to the Head, V. Himaja Kumar, Weaver's Service Centre Hyderabad and his team for his useful guidance, suggestions and help throughout the work.

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Traditional Embroidery of Himachal Pradesh "CHAMBA RUMAL"…A Diminishing Art

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Abstract

The handicraft sector plays a significant and important role in the country's economy[1]. Embroidery technique has its own special look and feel. Embroidery is one of the oldest and most popular methods of value addition for fabrics and garments· Indian embroidery is in vogue as traditional fabric ornamentation; it has a global appeal and is in demand all over the world.

Due to modernization and mechanization the utility value of the embroidery is decreasing A lot of craft is on the verge of diminishing[2]. Today only a few Indian regional embroideries are popular and in demand, the rest are on the verge of dying. Traditionally, women have practiced hand embroidery as an income generating activity for it is accessible without a large cash outlay and can be done in leisure time[3]. traditional embroideries which are not much popular are already on the verge of decline, which is a serious threat to the livelihood of women who practice art. So this study was conducted to learn about the popularity and the reasons behind the declining art of traditional embroidery of Himachal Pradesh "CHAMBA RUMAL".

Key words : Chamba Rumal, Regional embroidery, Needle miniature.

1. Introduction

Embroidery is an ornamental needle work done on a variety of fabrics which makes the fabric more attractive. Indian embroidery is identical to traditional fabric ornamentation. India is rich in heritage and culture. And Indian regional embroideries are as vivid and varied as the culture in India[4].

Embroidery has adorned almost every form of fabric... from handkerchiefs to quilts and wearable's to home décor products. Each state has its own excellence in craftsmanship. Women are the pioneers in creating excellent delicate embroidery since ancient times. Except in Kashmir, hand embroidery in all other states is done by women. The skill and finenese that goes into embroidery and fine works gives a garment a distinctive ethnic look. After all embroidery is an integral part of Indian culture. It gives a boost to the designer creations as it helps in adding different flavors to the garment and distinction to its wearers.[5]

2. Chamba Rumal

The word 'Chamba rumal' implies a peculiar visual art form that represents unique and charming embroidery done on a hand spun cloth with untwisted silken thread, which is greatly inspired from pahari painting. The tradition of this kind of pictorial embroidery was known & practiced in some areas of Himachal Pradesh and Jammu which remained once important centers of pahari painting. The embroidery depicted a fine, delicate, perfect manual work befittingly called as "needle miniature of Himachal" or "Pahari Rumal". This rumal had the base of creamy white color, on which beautiful human figures, ever green trees with colored blossoms, animals like goats and deers, saddled horse were embroidered. Rumal is Persian word which means a' kerchief ', a square piece of cloth worn on the head or around the neck[6].

Fabric : The fabric used as carrier in Chamba rumal was hand spun & hand woven cotton(khaddar) or fine muslin (mal-mal) of off white color. Off-white base of the fabric highlights the vibrant silken threads employed for filling up the drawing. Or the embroidery work done on choli, caps or coverlets the coarse khaddar; red or blue colour is used for the rumals. The most popular fabric, employed in Chamba rumals, was khaddar because of its availability, low cost and durability.

Threads : The figures as well as the floral patterns drawn on the Chamba rumals are filled in with the untwisted silk floss also known as pat. Sometimes, the women used to get the silk threads dyed selecting the tones and hues according to their fancy. The coloured noticed in the Chamba embroidery are: purple, brilliant pink, orange, carmine, deep red brown, lemon and deep yellow dark green, parrot green and green, ultramarine and Persian blue, black and white. Blue color is always used for Krishna, whenever he is bear-chested and crimson for feet. Red, blue and white colors are used for Brahma, Vishnu and Maheshwara respectively and Gopis in vivid colors of yellow and green or dark pink or crimson combination.

Stitches : The stitch used in embroidering the Chamba Rumal was the dorukha, a double – satin stitch, which as its name implies, can be viewed from two (do) sides or aspects (rukh). The stitch is carried both backward and forward and covers both sides of the cloth, effecting a smooth finish that is flat and looks like colours filled into a miniature painting. No knots are visible, and the embroidered rumal can be viewed from both sides. It thus becomes reversible. A simple stem-stitch using black silk thread is used to outline the figures. Other stitches like the cross stitch, the button hole stitch, the long and short stitch, and the herringbone stitch, as well as pattern darning, are also used occasionally.

Motifs : Chamba rumals are embellished with vivid decorative motifs and designs, which are the inseparable part of this pictorial handicraft. These

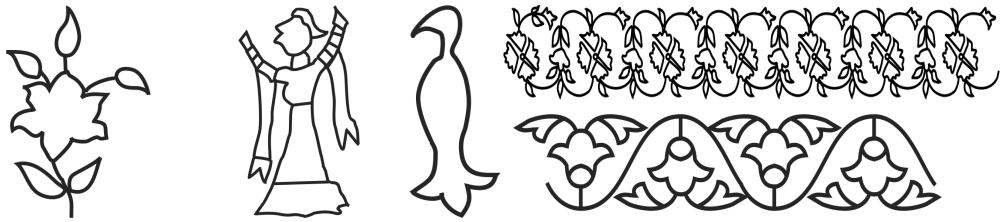

Fig 1. Motifs of Chamba Rumal

motifs and designs are used and laid carefully as fillers in the blank passive space of the compositions of the rumals. For instance, the motifs such as birds and animals, decorative plants and shrubs displaying a considerable variety, are seen invariably in several of rumals. A large number of motifs drawn from the animal & vegetable world such as parrots, peacocks, Cranes, partridges and sparrows, cows, elephants, horses, deer, wild boar and dogs, plantains, cypresses, willow trees, shrubs and plants (buti) and buds & flowers (phul) patterns etc. have been extensively used in chamba rumals [fig 1]. Animal works is seen mostly in the subjects depicting hunting expeditions in which horses and elephant riders are shown hunting the wild boars, deer, leopards, tigers and lions, cows with their calves are also skilfully rendered in the rumals showing Krishna legend. A great variety of buti and phul patterns are skilfully used as filler in the intervening blank space of the fabric by the painters. The space of rumals is in variably detailed with variations of trees, shrubs, decorative plants and phulpatti designs. Cypress trees with some variations have been used as an important decorative motif by the painters to beautify the compositions of the rumals.

The themes are mostly inspired by paintings and depict scenes from Indian mythology, Ramayan, Mahabharat, Ras lila, Krishna lila, Pahari paintings, hunting, marriage scenes, and game of dice. The scene of rasa lila is the common theme where the blue bodies Krishan leads the gopies in circular dance posture. The Rumals display other folk styles like marriage of Krishna and Rukmini, Vishnu in a lotus, Ganesh, Vishnu laxmi, pahari women playing musician instruments, men smoking hukka, the pipe and so on[4].

A large number of household textile articles are prepared of Chamba embroidery. And the most common is the rumal, almost synonymous with the work, whose size ranged from twenty to thirty five inches. Wall hanging with various themes from Mahabharata, Purana ranged from two to several feet rectangular shapes. Sometimes even cholis are embroidered.

3. Objectives

- To study awareness of regional embroideries in female from Aurangabad city in Maharashtra.
- To study in detail about likings of female for Chamba rumal.

4. Methodology

In the present study, survey method was adopted for the purpose of data generation. The data was collected using standardized research instruments i.e. questionnaire. The awareness and liking of female students regarding the Indian regional embroidery was determined with the help of a structured and standardized questionnaire

The preliminary study was conducted on a sample size on 500 women respondents from Aurangabad city across the age group of 16-24, all of them were familiar with different kinds of embroideries. This just goes to show the significance of embroidery in Indian wear. Differing from region to region, embroidery work is considered an intricate work of art in traditional wear

5. Results

Table 1. Awareness of Indian regional embroideries

Sr. No.	Awareness of Indian regional embroideries	No. of respondents	Percentage
1	Yes	343	68.60%
2	No	157	31.40%

Although India is rich in culture and heritage it is very surprised to know that many people are not aware about the rich traditional embroideries of India. When judged about the awareness of embroidery. From the above table 1 it was noted that 500 of the total respondents were aware of embroideries but contradictory to this is that only 343 (68.60%) of the total respondents were aware about regional embroideries of India and remaining (31.4%) respondents are unaware of Indian regional embroideries. Hence, it may be concluded that a noticeably ($P<0.05$) high percentage of women

Table 2. Awareness about different types of regional embroideries

N=343

Sr. No.	Regional embroideries	No. of respondents	Percentage
1	Phulkari of Punjab	219	64%
2	Chikankari of Lucknow	236	69%
3	Manipuri embroidery	82	24%
4	Chamba Rumal of Himachal Pradesh	79	23%
5	Kutch and Kathiawar embroidery of Gujarat	240	70.5%
6	Kasuti embroidery of Karnataka	123	36%
7	Kashmiri embroidery	308	90%
8	Kantha of west Bengal	212	62%
9	Kashida of Bihar	113	33%

are aware of Indian regional embroideries .

Regarding awareness about Indian regional embroideries of India it was noted that only few traditional embroideries like Kashmiri, Phulkari, Chikankari, Kutch and Kathiawar & Kantha are popular. **Table 2** shows majority of respondents are aware of Kashmiri embroidery as it gains highest popularity among the traditional embroidery with 90% (308). On the second position is 70.5% (240) respondents were aware of Kutch and Kathiawar followed by Chikankari 69% , phulkari 66% and Kantha 62%. However, awareness about Kasuti (36%), appliqué (33%), Manipuri (24%) and Chamba rumal (22%) is low. Hence it may be concluded from the study results that significantly (P<0.05) high percentage of women are aware of Kashmiri, Kutch and Kathiawar, Chikankari and Phulkari type of embroidery

Table 3. Chamba Rumal of Himachal Pradesh

N=79

Sr. No.	Details	No. of respondents	Percentage
1	Base fabric	33	41.77%
2	Motives	72	91.14%
3	Threads	49	62.03%
4	Color of threads	61	77.22%
5	Stitches	67	84.81%

Chamba Rumal is not a very popular embroidery as it is not much in use for the apparels thus, it has gained very low popularity with about 23% as given in table 3but whoever had an idea about this embroidery are very much aware about the motives used i.e. the mythological motifs which topped the chart of 91.14% followed by the stitches 84.81%, colors with 77.22%, threads used 62.03%, but very few knew about the cots wool or the silk based fabric i.e. only 41.77%

6. Conclusion

On the basis of study results it can be concluded there is excellent level of familiarity of embroidery work amongst the girls of study region also substantially (P<0.05) high percentage of women from Aurangabad region are aware of Indian regional embroideries. When studied about **Awareness of different types of regional embroideries the** results showed that significantly (P<0.05) high percentage of women are aware of Kashmiri, Kutch and Kathiawar, Chikankari and Phulkari type of embroidery but **Manipuri, Chamba Rumal and Kashida of Bihar** embroideries are less popular. When specifically studied about Chamba Rumal embroidery significantly (P<0.05) high percentage of girls are aware of stitches, motives and colour of the thread of **Chamba Rumal** embroidery. A contradiction to the above conclusion is that the awareness of these particular embroidery was observed to be less amongst the respondents. Hence a fare conclusion can be drawn that the respondents may be aware of these embroideries through college subjects and hence have sufficient knowledge

about these embroideries. Another reason may be the predominant use of Mythological figures which restrict the use of embroidery on apparels.

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A Study of Colour Preferences of Educable and Trainable Mentally Challenged Children

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Abstract

The present research was conducted on "colour preferences of educable and trainable mentally challenged children."The purpose of conducting the study was dealt with as individual colour preferences in clothing fabrics. The subjects of this study were 250 mentally challenged educable and trainable children between the age group of 5 to 14 years of age out of which 60% were boys 40% girls The test consisted of nine colour Aline dress of rubia fabric. The collected data was consolidated and statistically analysed. The data was initially treated with descriptive statistics (mean & SD) For inferential purpose the data was subjected to 2x2 ANOVA,The findings of the present study from the statistical treatment and analysis of the data revealed that ,there is existed significant difference between the trainable and educable mentally challenged children. The most preferred colour was red,yellow and black by trainable boys, Where as the most preferred colour was white, red, yellow by educable boys Trainable mentally challenged girls gave the first preference to red colour followed by orange and yellow. Educable girls gave the first preference to white, followed by red and yellow.

Key words : colour, preferences, educable, trainable, mentally challenged, children.

1. Introduction

Mental retardation occurs in 2.5-3% of the general population. Mental retardation begins in childhood or adolescence before the age of 18. In most cases, it persists throughout adulthood. A diagnosis of mental retardation is made if an individual has an intellectual functioning level well below average and significant limitations in two or more adaptive skill areas. Intellectual functioning level is defined by standardized tests that measure the ability to reason in terms of mental age (intelligence quotient or IQ). Mental retardation is defined as IQ score below 70-75. Adaptive skills are the skills needed for daily life. Such skills include the ability to produce and understand language (communication); home-living skills; use of community resources; health, safety, leisure, self-care, and social skills; self-direction; functional academic skills (reading, writing, and arithmetic); and work skills. In schools for the mentally challenged children, it was observed that the mentally challenged children are very much attracted towards different color lights, pictures, toys, games and music.[1]

A mental handicap is defined as significantly sub-average general intellectual functioning existing concurrently with deficits in adaptive behavior and manifested during the developmental period.

1.1 An educable mentally challenged student is a student who is mildly impaired in intellectual and adaptive behavior and whose development reflects a reduce rate of learning. The measured intelligence of an educable mentally handicapped student generally falls between two and three standard deviations below the mean, and the assessed adaptive behavior falls below that of other students of the same age and socio-cultural group. Their IQ score is from 50-70.

1.2 A trainable mentally challenged student is a student who is moderately or severely impaired in intellectual and adaptive behavior and whose development reflects a reduce rate of learning. The measured intelligence of a trainable mentally handicapped student generally falls between three and five standard deviations below the mean, and the assessed adaptive behavior falls below that of other students of the same age and socio-cultural group. Their IQ score is from 30-50.[2]

Colour

Colour affects human beings in their every day lives, even during their very earliest childhood. In fact, studies have shown that babies respond more readily to bright, primary colours than to pastel colours. Children like colours and have a crush on it. Colour is the first thing which a child can distinguish from one objective characteristic to another. Children can identify the colours and with growing age expand their differences in colour preferences. We all know that a baby can distinguish between black and white. However, it is know that a child can distinguish different colours from two months of age. The first colour a baby can distinguish is red. Then, they can understand the other bright colours, including yellow. Children like bright colours. Many authoritative researchers on colours have shown that, the child will increase their colour preference with their growing age. At ten years of age many children like red and yellow (or rose), and after ten years age, it is mostly blue. As with the growing age children can experience various nuances of mood. This affects the ability in their colour preferences and personality. It is observed that children selecting different colours can have their personality revealed whether he is happy or in a sad mood depending upon the colour they have chosen.[3]

Age has a lot to do with color preferences. Children, for example, like different colors from adults. This is because children see color differently than adults.

1.4 Why do children see colors differently from adults?

Children see colors differently from adults because children's eyes are younger and have not changed due to the aging process. Consequently, their

eyes absorb 10% of the blue light that passes through their eye lenses. Adults, however, absorb 85% of the blue light that pass through their eyes. This is due to the fluids in the lenses yellowing with age.) The result is that many adults prefer blue while kids prefer something like yellow.

The favorite color of most preschool children, up to the age of five, is bright red. Young children, between five and ten years old, show a preference for bright yellow. Adult women generally prefer blue-based colors, whereas men tend to prefer yellow-based tints.[4]

Hence with due consideration present study is undertaken to study the colour preferences of educable and trainable mentally challenged children between the age group of 5 to 14 years. Since studies have already been done on normal children the investigator thought it is important to conduct study to get some insight into the colour and fabric design preferences of educable and trainable mentally challenged children

1.5 Aim of the Study

The main aim of the study is to determine the colour preferences of educable and trainable mentally challenged children between the age group of 5 to 14 years of Nagpur city

The Study Was Planned With Following Objectives

1. To investigate the colour preferences of educable and trainable mentally challenged of Nagpur city
2. To investigate the colour preferences varied with age of children.
3. To investigate the colour preferences varied with sex of children.
4. To compare the colour preferences varied with two age groups younger (5 to 9 yrs) and older group (9 to 14 yrs).
5. To compare the colour preference of normal and mentally challenged children.

2. Review of Literature

The investigator reviewed the relevant literature that was available to her. Quiet a few studies on colour preferences of normal children have been done, but very little has been done on mentally retarded children.

The Review of Literature for the study was collected under two sections

1) Review related to educable and trainable mentally challenged children.

2) Review related to colour preferences of normal and mentally challenged children

A study on “colour and design preferences of mentally retarded teenagers”. The purpose of conducting the study was dealt with relationship among physical and personality characteristics and as individual colour design and texture preferences in clothing fabrics.The subjects of this study were 47 mentally retarded teenagers, 33 boys and 14 girls, ranging in the age 12 to 18 years from low so-

cioeconomic levels. The test consisted of 78 colour slides of apparel fabrics. 11 variables delineate certain characteristics of colour, design, size and texture. Preference scores for each subject are calculated by totaling the number of choices for each variable.[5]

Results revealed that

1. This group of mentally retarded teenager tends to prefer saturated colour with small designs and strong figure ground contrast as well as smooth textured fabric.
2. High school and college students tend to prefer highly saturated colours.

The research project 'Perception of colours by Mentally handicapped pupil' was carried out in a group of 72 boys with a slight mental handicap, pupils of special schools (13–15 years). The research was carried out using questionnaires administered under the direct supervision of a researcher. Each question had nine possible answers: a range of nine colours differentiated by tint, while keeping approximately the same saturation and value of colour. The research presents the results of an examination of colour preference in probands with slight to moderate mental handicaps. The results show that probands with a slight mental handicap tend to be sensitive in relation to colours, even in their abstract form. They prefer blue, respectively green and red, and they have difficulties with perception of black and violet. The favourite colour preference in probands with a more serious mental handicap is more variable than in probands with a slight mental handicap.[6]

There are few similarities between the above studies and the present study. The present study of colour preferences of mentally challenged children is compared with similar studies done on normal children.

3. Methodology

Sample : The sample of present study comprised of 250 educable and trainable mentally challenged children of different schools of Nagpur district between the age group of 5 to 14 years of age out of which 60% were boys 40% girls

3.1 Procedure of Data Collection

The data was collected in two phases

First Phase

A survey was undertaken to find out how many mentally retarded schools were there in Nagpur city and Nagpur district with the age group of 5 to 14 year old educable and trainable mentally challenged children and how many special schools are ready to cooperate the researcher for data collection

Second Phase

After selection of schools the data was collected on colour preferences of educable and trainable mentally retarded children.

The structured interview method was used for the present study. The test was administered to individual child. The study was conducted under natural light. Nine coloured unisex A line garments, in three primary (red, yellow & blue), three secondary (orange, green & violet) and three neutral colour (black, white & grey) for girls and boys, was used for recording the rank order of colour preferences the garments were placed on table by random order. The table was placed in a place where natural lights, falls on all garments equally. Then the child was asked to show one he/she liked the best. The garment was removed form the table and the child was asked to show one he/she likes the best one from the remaining eight. The same procedure was repeated till one garment was left. After that the data was analyzed to find out the order of colour preferences the most preferred colour and least preferred colours.

3.2 Stastistical Analysis

The collected data was consolidated and statistically analysed.

The data was initially treated with descriptive statistics (mean & SD)

For inferential purpose the data was subjected to 2X2 ANOVA.

4. Result and Discussion

The data was categorized into two groups on the basis of age. The percentage of children based on age are displayed in Table 1.

Table 1. Distribution of mentally challenged children according to age.

Age	Boys		Girls	
	Total	Percentage	Total	Percentage
5-9 years	64	25.6	52	20.8
10-14 years	86	34.4	48	19.2
	150	60	100	40

From the above table it is seen that 25.6% of boys and 20.8% of girls belong in the younger age group and 34.4% boys and 19.2% girls belonged to the older age group.

IQ is the characteristic on the basis of which mentally challenged children are categorized. As the present study dealt with educable and trainable children, the data was categorized into two levels of retardation and is presented in Table 2.

It is seen that 63.33% boys and 61% girls belonged to trainable category and 36.67% boys and 39% girls belonged to educable category.

Table 2. Distribution of mentally challenged children according to IQ level.

Sr. No.	IQ	Boys		Girls	
		Total	Percentage	Total	Percentage
1	30-50 (Trainable)	95	63.33	61	61.00
2	50 to (Educable)	55	36.67	39	39.00
Total		150	100.00	100.00	100.00

In the present study an attempt was made to study the preferences for colours of mentally challenged children. Therefore the data was categorized into four groups.

- Trainable mentally challenged boys.
- Educable mentally challenged boys.
- Trainable mentally challenged girls.
- Educable mentally challenged girls.

The data for trainable mentally challenged boys was subjected to mean and S.D. and the colour . preferences. The results are displayed in Table 3.

Table 3. Mean, S.D. and colour preferences. of trainable mentally challenged boys

Trainable Boys				
Sr. No.	Color	Mean	SD	Preferences
1	Red	3.06	2.46	I
2	Yellow	4.37	2.84	II
3	Blue	5.19	2.41	VI
4	Orange	4.82	2.46	V
5	Green	5.72	2.39	VIII
6	Violet	5.31	2.27	VII
7	Black	4.79	2.23	III
8	White	4.81	2.73	IV
9	Grey	6.33	2.31	IX

A look at Table 3 clearly reveals that the first or the most preferred colour was red. The second preferred colour was yellow The third most preferred colour was black. The least preferred colour was Grey.

The data for educable mentally challenged girls was subjected to mean and S.D. and the colour . preferences. The results are displayed in Table 4.

Table 4. Mean, S.D. & colour preference score of educable mentally challenged girls

Educable Girls				
Sr. No.	Color	Mean	SD	Preferences
1	Red	1.42	2.5	II
2	Yellow	2.12	2.66	III
3	Blue	3.14	2.18	V
4	Orange	2.6	2.32	IV
5	Green	5.13	1.94	VII
6	Violet	4.9	2.35	VI
7	Black	5.9	2.74	IX
8	White	1.12	2.66	I
9	Grey	5.24	2.91	VIII

From the table, it is seen that the most preferred colour of educable mentally challenged girls was White – a neutral colour the second most rated colour was Red and the third most preferred colour was Yellow - both the colour belonging to primary colour scheme. These children least preferred colour was black - a neutral family colour.

It is seen that gender as a factor failed to influence the colour preference of mentally challenged children. The results can be explained as follows The second factor of trainable vs mentally challenged children brought about significant differences i.e. the calculated value of F.=6.89 (for df1 & 32 is more than the table value at 0.05 level.

Summary of 2 Way ANOVA for colour preference of mentally challenged children

Sr.No.	Sources of variation	df	SS	MSS	F
1	Gender (Boys vs Girls)	1	0.05	0.05	0.02
2	Preferences of Colors(Trainable Vs Educable	1	16.39	16.39	6.89*
4	Interaction	1	0.19	0.19	0.08
3	ESS	32	76.10	2.38	
5	Total	35			

Significant at 0.05 level.

This means there is real difference amongst the two groups with reference to colour preferences. This can be explained in terms of IQ level. The IQ of the child influnces the colour preferences. The child whose IQ is nearer to average IQ gets a fair understanding of others reactions to his choice and therefore prefers colours which are approved by others. On the contrary low IQ children prefer colour as per the brightness of the colour without looking for approval from others.

Table 5 exhibits the colour preference of trainable mentally challenged boys of younger age (5-9 years**)**

From Table 5 it is seen that the younger group of boys preferred the red colour first, a primary colour, which was followed by white colour – a neutral colour and the 3rd most preferred colour was orange, a secondary colour. Table 6 exhibits the colour preference of trainable mentally challenged girls of older age group (10-14 years**).**

Table 5. Mean & S.D. scores of preferences of colours of educable and trainable mentally challenged boys of younger age (5-9 years)

S.N.	Color	Mean	SD	Preferences
1	Red	3.31	2.62	I
2	Yellow	4.53	2.71	IV
3	Blue	5.94	2.23	VIII
4	Orange	4.42	2.6	III
5	Green	5.73	2.5	VII
6	Violet	5.23	1.75	VI
7	Black	5.15	2.3	V
8	White	4.19	2.75	II
9	Grey	6.11	2.42	IX

Table 6. Mean and SD score of preference for colours of educable and trainable mentally challenged girls of older age group (10-14 yrs)

Sr.No.	Colors	MEAN	SD	Preferences
1	Red	3.23	2.55	I
2	Yellow	4.88	2.02	IV
3	Blue	5.48	2.28	VII
4	Orange	4.52	2.28	II
5	Green	5.17	2.4	VI
6	Violet	4.69	2.69	III
7	Black	6.08	2.45	VIII
8	White	4.92	2.82	V
9	Grey	6.1	2.7	IX

From the above table it is seen that educable and trainable mentally challenged girls of older age group also gave the first preference to Red colour, followed by Orange colour and Violet colour. The least preferred colour was Grey.

5. Conclusion

The results of present study revealed that red colour is the most preferred colour by educable and trainable mentally challenged children of Nagpur city, followed by white, yellow and orange colour It is interesting to note that the respondent's most preferred colour red is from primary colours followed by white a neutral colour and orange (secondary colour) and least preferred colour were grey, blue and green, Some related studies revealed that the normal children prefer primary colours as most preferred colour and according to present study the mentally challenged children prefer primary colours as most preferred colour along with neutral and secondary colour

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Brand Image of Five Star Hotels in Hyderabad

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Abstract

This study is based on the brand image of five star hotels in Hyderabad. The researcher chose this project because branding allows companies to establish a unique, differentiated identity for their properties while making them relevant to the desired consumer. Successful branding contributes to awareness, loyalty and affinity. While creating a brand is a challenging process for all industries, in the hotel industry, branding presents a unique set of challenges and opportunities. After analyzing the various aspects it was found that the brand image depends on reliability, assurance and tangibility. From the study it can be concluded that a brand strengthens the preference for the guest while choosing a hotel. Also that the brand popularity does increase by proper advertising of the services it provides. It can be concluded that the loyalty/trust should be well lived up to the expectations of the guest to have them as repeat customers and also so that the guests spread the brand positively by word of mouth publicity. It can be suggested that hotels should try and target all age groups to increase the brand popularity.

Key words : Brand image, reliability, trust.

1. Introduction

Brand is a unique element (e.g., name, symbol, design) that identifies the products or services of one organization from those of competitors, and contributes to enhancing the value of the offerings.[1] Brand image is a consumer's perceptions and feelings towards a brand shaped by direct/indirect brand experience, which captures cognitive, sensory and emotional aspects. Brand image is the current view of customers about a brand. It can be defined as a unique bundle of associations within the mind of target customers. It signifies what the brand presently stands for. It is a set of beliefs held about a specific brand. In short, it is nothing but the consumer's perception about the emotional value and not just the mental image. A brand is offering from a known source. A brand name such as Mc Donald's carries many association in people's mind that make up the brand image- hamburgers, fun, children, fast food, convenience, etc. all companies serve to build a strong, favorable and unique brand image.[2] Beliefs thus reinforce brand images, either negative or positive which affect consumer's purchases. Beliefs seem to encourage travelers to hold certain attitudes towards hotels and brands thus we believe that it is important for hotel

managers to make their guests hold a positive image by communicating to them the values which the hotel as an organization has through their brand and service. In other words when the hotel enjoys a good image, then the traveler feels confidence about the hotel's ability to meet his/her expectations so s/he trusts the hotel. From this argument we can extract that a good image creates trust, but does trust create good image? Well, when presenting the experts' answers it is said that organizations which are often users of business travel services want to hold long term relations with their hotel partners. A long term relation which as they said is built on communication, understanding and service consistency makes the user trust the hotel and so positive image for the hotel is created.

Conceptual model : Brand image stems from all of a consumer's consumption experiences, and [perceived] service quality is a function of these consumption experiences. Hence, customer perception about service quality directly affects "brand image". This relationship is summarized as: Perceived Quality has a significant positive impact on Brand Image. Tangibility has a significant positive impact on Brand Image. Responsiveness has a significant positive impact on Brand Image. Reliability has a significant positive impact on Brand Image. Assurance has a significant positive impact on Brand Image. Empathy has a significant positive impact on Brand Image.[3]

1.1 Purpose of study

By this research a company can know whether it is better to carry on a brand or not and what scope it has in a metropolitan city. The researcher has chosen Hyderabad for the research because it has a varied clientele . And also due to the existing five star hotels and brand hotels in Hyderabad, the scope of research could be broader. The researcher will study the impact of brand image on customers. Also the research will include the study about a brand, it's image, and its preference in the customer's mind.

1.2 Aim

To study the brand image of five star hotels in Hyderabad.

1.3 Objectives

1. To understand the concept of brand image in five star hotels.
2. To study the impact of brand image on various categories of customers visiting a hotel.
3. To find out whether brand image strengthens the preference / popularity for the guests while choosing a hotel.

1.4 Limitations

1. Brand does not reach all the clients.
2. No proper previous research work available.

2. Materials and Methods

Selection of area:- For this topic the researcher has selected Hyderabad as

the sample because there are more five star hotels there. Therefore there is wider scope to study them as compared to Nagpur.

Selection of sample : The reason for selecting five star hotels is because the researcher wants to study about the brand image of five star hotels and that too specifically of Hyderabad . Purposive sampling was used in this research.

Sample size **:-** 100

The samples were : 40 from the hotel staff and 60 from guests.

Data collection

In order to get information about the study the researcher collected the data from two sources which were-

i. **Primary data :** Through questionnaires, observation, interview. Questionnaires were given to the hotel staff and guests visiting those hotels.

ii. **Secondary data :** Journals, books, internet (websites), newspapers etc.

Data analysis

The collected data as per the requirement of the study carried was tabulated and analyzed and result was discussed by means of figures and graphs followed by interpretation.

3. Results and Discussion

Table 1. Factors while choosing a hotel

Sr. No.	Options for selection	No. of respon-dents	Percen-tage (%)
1.	Brand image	18	30
2.	Location	15	25
3.	Value for money	11	18.33
4.	Other services	9	15
5.	Publicity	7	11.66

From table 1 the researcher can say that brand image with 30% of the score is an important factor while choosing a hotel. Publicity at 11.66% is the least factor while choosing a hotel from the above table. On an average rest of the factors those are location 25%, value for money 18.33%, other services 15% are also some factors while choosing a hotel. Therefore it is clear that more weightage is given to the brand image.

Table 2. Preference (by gender) of staying in a brand hotel

Sr. No.	**Sex**	**No. of respondents**	**Percentage (%)**
1.	Male	36	60
2.	Female	24	40

From the table 2, the researcher can say that more males prefer to stay in a brand hotel i.e. 60% than females which is 40%.

Table 3. Age of the guest frequenting a hotel

Age (yrs) →	18-25	26-40	41-50	51-60	60 & above
	-	22	23	3	2

From table 3, the researcher can conclude that people between the ages of 41-50 years frequently visit a chain hotel and just below that are between 26-40 years. And the least is 60 years and above and 51-60 years and no one between the age of 18-25 years.

Table 4. Impact of Brand image

Sr. no.	Reasons	No. of respondents	Percentage (%)
1.	Tangibility	3	7.5
2.	Reliability	32	80
3.	Assurance	5	12.5

From table 4, the researcher can say that the brand image according to the hotel depends on the reliability towards a hotel i.e. 80% the most.

Then, followed by assurance given by the hotel i.e. 12.5% and the last is tangibility i.e. 7.5%.

Therefore, reliability is the most important factor of a hotel image of a brand.

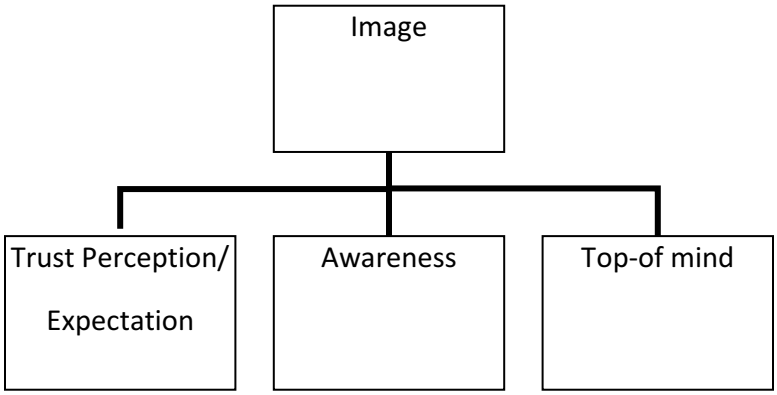
From table 5, the researcher can conclude that the rating of customers perception of a brand from all of the above criteria are that good quality is the most important factor of a brand with followed by quality of service given, then the value for money and then good location and last other facilities that can include spas, clubs, gyms etc. (5 is the highest and 1 is the lowest)

4. Conclusion

Brand image is a very good support for any hotel as it impacts the selling of the hotel in all ways. Brand image is also the most important factor while choosing a hotel. But reliability of a brand is very important for any hotel. To maintain a brand along with the local touch, it should be uniform in standardizing the conceptual procedures which should reflect whichever brand any person chooses all around the world. To maintain a brand now a day online is one of the most popular methods. Accommodation plays the most important role while emphasizing on the services that a brand provides. Quality of service increases the brand strength, hotel's image, also that's what is demanded by today's travelers and the major reason to choose a brand hotel over a non-branded one. Brand popularity does spread among the guest by websites. It

Table 5. Rating of customers perception of a brand

Rating	Value for money	Good quality	Good location	Quality of service	Other facilities
1	-	-	15	-	13
2	1	-	9	3	25
3	20	7	10	4	2
4	7	16	9	18	-
5	12	17	2	16	-



is a very popular method these days to keep up the popularity of a brand hotel. People even equally choose to book through websites (online) but some of them still do prefer contacting the hotel directly. Services and qualities of a brand make a guest notice a brand. The features and targeting the guests in the right way shows that a brand understands them. Majority of the guests always do prefer a brand over a non-brand while choosing a hotel to stay. Also that advertising should be done by a brand to keep up with the current on going trends. Marketing does increase the selling of a brand but also that it should be done in a proper way to target the right client and to reach to the standards of customer satisfaction. And on an average people do prefer to stay in a brand hotel due to reasons like quality services, value for money and the features that it provides all over the world with the same uniformity. Hotel brand model was re arranged and added trust as another factor which affects the hotel's image.

5. Suggestions

From the study the researcher can suggest that the hotel should try and target wider range of the clientele ,hence the hotel should concentrate on targeting all sets of people. There should be an increase of other services like spas, gyms etc. Also that publicity should be done through advertising that also includes through online. The loyalty/trust should be well lived up to the expectations of the guest to have them as repeat customers and also so that the guests spread the brand positively by word of mouth. As location also does matter a brand while choosing to stay, the brand hotel must make sure that it is located in a good place which is easily accessible from all business centers and transport facilities. There should be more offers that include discounts and memberships given to the guests to have more and more customers to the hotel. A brand should also be unique and more emphasis should be given to it while creating and maintaining a brand image. A brand should try and target all age groups to increase the brand popularity. There should be some offers for all age groups to increase the customer flow into the hotel. Even the restau-

rants and banquets should be marketed well to make the brand more popular in terms of other facilities too. There also should be different and protective facilities given to the females especially to make them feel more protected and with that one reason females will always choose a brand hotel to stay. In general, people have an image of brand hotels to be expensive but the hotel should inform people about all the costs and expenses, total details including the costs and other services provided by the hotel should be well mentioned. Future research is suggested to further find out the reasons for the finding.

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Study on Cross Training in Star Hotels of Nagpur City with Special Reference to Front Office Department

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Abstract

In the cut throat competition of today's world in which the hotels are operating requires skilful personnel in every organisation in order to remain a unbeaten performer in the spirited game of the industry. One of the main troubles which occur in the workplace is the lack of training. A large number of employees can appear dissatisfied due to being assigned responsibilities without-having the right knowledge and skills in that area.

The overall aim of this study was to assess the importance of Cross training in work field. For many years now human capital has been regarded as vital for the efficient functioning of an organisation because of its contribution in improving productivity, business performance and economic growth. Therefore it is important to devote in human resources through training in order to improve the competitive position of the firm and because of the enhanced quality, innovation, continual increased productivity and in turn improved profitability that can be achieved through this. Throughout this study research the need of cross training system in star hotels of Nagpur city was examined and appropriate recommendations for a more effective training system were given as Cross training can unquestionably add value by giving an employee the opportunity to expand their career and skill sets in the workplace. This in turn helps boost their confidence level and promotes a positive attitude. They also demonstrate loyalty to your company, thereby providing quality service and value to your guest or customer.

Key words : Cross Training, importance of training, Competitive position.

1. Introduction

Today the highly competitive market in which business operates, require skillful workforce in order to remain successful player in a competitive game of industry. One of the main obstacles which occur in the workplace is lack of training and development. Training is the essential process which should be cautiously designed and implemented within all firms[1].

Training is the process that provides employees with the knowledge and skills required in operating within the system and standards set by the management. Human resource man-

agement is a function in an organization designed to maximize in service of an employee's strategic performance.

HR is primarily concerned with the management of the people within the organization focusing on policies and on systems. HR department is an organization typically undertakes a number of activities, including employee recruitment, training and development, performance appraisal and rewarding.

Cross training is training an employee to do different part of the organization' work. Training worker A to do the task that worker B does and training worker B to the task that worker A does is cross training. Cross training is good for managers because it provides flexibility in managing workforce to get the job done. However, done right, cross training is good for the employees also it lets them learn new skills, makes them more valuable and combat boredom[2].

Significance of the study

The researchers aimed to study briefly the concept of cross training and benefits with respect to front office department only. Front office is one of the highest revenue generating department of the hotel therefore it is necessary to train the staff to increase the ability to perform tasks and improve productivity of the organization.

Cross training employees improves flexibility, productivity, bench strength and employee's marketability. Cross training is a great way to improve employee's versatility and employees with multiple talents creates a stronger team. Cross training can unquestionably add value by giving an employee the opportunity to expand their career and skill sets in the workplace. This in turn helps boost their confidence level and promotes a positive attitude. They also demonstrate loyalty to your company, thereby providing quality service and value to your guest or customer.

Aim

To study the concept of cross training in the star hotels of Nagpur city with special reference to Front office department.

Objectives

- To study the concept of Cross training.
- To describe the importance of cross training in the hotels.
- To find out the merits and demerits of cross training.

Limitations

- Time, money & energy were the major constraints.
- Study was limited to star hotels only & specifically to Nagpur city only.
- Sample size was limited to 20 only.
- Out of 20 questionnaires 19 were completed and filled by the respondents and were included in the study.

Research methodology

The detail methodology adopted for the present study has been given below.

Research Design

The descriptive research design has been adopted due to the nature of the study. Descriptive research, also known as statistical research, describes data and characteristics about the population being studied. **Descriptive research answer the questions who, what, where, when and how**. Thus, on the basis of the above, the descriptive research design was appropriate for the study as it was important to gauge the various aspects of cross training among the star hotels of Nagpur city.

Selection of Area

For the present study Nagpur city which is the second capital and the third largest city of the Indian states of Maharashtra was selected. It is the 13th largest urban agglomeration in India and the largest city in Vidarbha. Nagpur city is growing in terms of hospitality industry and it is home to many industries.

Selection of Sample

A convenience sampling approach was employed and 20 questionnaires were distributed to the employees. Out of these 20 questionnaires 19 were completely filled by the respondents and were returned to the researcher and thus included in the study.

Method of Data collection

The objectives of the study were conveyed/briefed to all the respondents before data collection to get proper response. The data was collected by researchers only.

Primary data collection

Primary data consisted of survey method which was done with the help of structured questionnaire.

Secondary data collection

Secondary data collection consisted of detailed literature search by referring various books, journals, article and electronic media.

Research Instrument

For effective and flawless data collection, it is necessary to have an effective and flawless research instrument. A self structured questionnaire was developed and was used for the research. For the present study survey method has been used and the data was collected with the help of questionnaire. Questionnaire was distributed among the well identified Hotels of Nagpur city.

Results and Discussion

This chapter presents the findings from the questionnaire that was collected from the respondents in the Nagpur region. The main study was conducted during the period of 23rd December 2015 to 1st January 2016. The target population of the study was full time employees who worked in this particular hotel during data collec-

tion period. The questionnaire was divided into two parts, the first part of the questionnaire contained questions relating to socio-demographic data about the respondents. The second part was designed to gather information about the role of cross training. A questionnaire was developed and distributed which was analyzed in line with the objectives set out and the findings are presented and discussed below.

Social Demographic factors

During the survey it had been confirmed that out of 19 respondents 10 were male and 9 were female where all the respondents Indian nationals. Majority of the respondents were aged between 20-30 years with the qualification of bachelor degree. It was observed that maximum number of respondents had a salary structure between 10,000-20,000 Rs. Majority of the respondents were working at associate level. After completing the survey with the help of the structured questionnaire following results were observed.

Table 1. Knowledge of Cross Training

Sr. No.	Response	No. of respondents	Percentage %
1	Yes	16	84
2	No	03	16
	Total	19	100

Source- Field study

Table1 showed excellent and positive results as maximum of the staff was well aware about cross training in the hotels. It is very much necessary to utilize and implement training in a proper way. Staff should be trained adequately to get positive results.

Table 2. Necessity of Cross training in Hotels

Sr. No.	Response	No. of respondents	Percentage %
1	Yes	16	84
2	No	03	16
	Total	19	100

Source- Field study

According to the results tracked from the recorded data shown in Table 2 it is completely understood that cross training is very important aspect and is largely required in the hotel industry. Maximum respondents have completely agreed with the fact that training is an important tool in improving the working abilities of the staff.

Table 3. Employees in need of Cross Training

Sr. No.	Designation	No. of respondents	Percentage %
1	Managers	6	31
2	Executive	7	36
3	Associates	3	15.7
4	Supervisors	3	15.7
	Total	19	100

Source- Field study

Table 3 says that cross training is basically necessary for the upper level management. .Maximum number of respondents had agreed that Executives should undergo cross training while

31% of the respondents said that Managers need the training and equal number of respondents have said that Associates as well as Supervisors should undergo cross training.

Table 4. Reason behind Front office to undergo cross training

Sr. No.	Reason	No. of respondents	Percentage %
1	To increase productivity	2	10.5
2	To improve standards of the organization	5	26.3
3	To enhance working ability of the staff	11	57.8
4	None of the above	1	5.4
	Total	19	100

Source- Field study

As per Table 4 it can be said that cross training highly results in enhancing the working ability of the staff and also in improving the standards of the organization as 57.8% respondents had opined in enhancing the working ability of the staff while 26.3% of the respondents have said that it would improve the standards of the organisation. 10.5% believed in increasing the productivity.

Table 5. Training Module

Sr. No.	Module type	No. of respondents	Percentage %
1	Online Training	10	52.6
2	Train the trainer	5	26.3
3	Classroom based training	1	5.4
4	Direct Training	3	15.7
	Total	19	100

Source - Field study

As per the data recorded in the Table 5 it is believed that maximum staff is interested for online training followed by 26.3% for train the trainer. 15.7% of the respondents believed in direct training while 5.4% supported class room based training. It is very much important to select a proper module to carry out cross training efficiently. However it is the job of Human resource department to select the training module.

Table 6. Practices to be followed during training

Sr. No.	Type of Practice	No. of respondents	Percentage %
1	Ice Breaker	2	10.5
2	Lateral Thinking	5	26.3
3	Shadowing	7	36.8
4	Team Building	5	26.3
	Total	19	100

Source - Field study

Table 6 indicates that 36% of the respondents think that shadowing was the most preferred practice that needs to be followed in the front office department while equal number of respondents said that lateral thinking and team building should be followed. It is very important to build in a good relationship between the senior staff and the associates and such practices will help in achieving the same.

Table 7. Merits of Cross Training

Sr. No.	Merits	No. of respondents	Percentage %
1	Good for business	11	57.8
2	Cost Saving	4	21.2
3	Replacement workers	2	10.5
4	Motivation	2	10.5
	Total	19	100

Source - Field study

Table 7 shows that majority of the respondents have agreed that cross training has its own benefits that can prove futile to the organization resulting in efficiency and profitability. 21.2% of the respondents have said that it would help in saving the labour costs and equal number of respondents have it would be good for replacement of workers as well as motivation factor.

Table 8. Need of Cross Training

Sr. No.	Needs	No. of respondents	Percentage %
1	To improve marketability	6	31.5
2	To improve bench strength	2	10.5
3	To improve co-ordination	8	42.1
4	To improve flexibility	3	15.9
	Total	19	100

Source- Field study

Table 8 clearly states that cross training would help in improving the co-ordination among the staff.31.5% of the employees feel that it would improve the marketability of the organisation and 15.9% felt that it would improve the flexibility of the staff. 10.5% felt that it would improve the bench strength.

Conclusion

Training is often seen as a way to facilitate change, but it must be recognized that training affects everyone in an organization directly or indirectly. If well done, increased profits, promotions, and new jobs may result. If poorly conducted, there can be many negative effects, such as loss of credibility with employees, decreased performance, and increased conflict. In today's hospitality industries are seeking to minimize their training expensive by relying more on colleges and universi-

ties to prepare students for careers in the industry. For accounting purpose, training is viewed as an expensive, but it should also be viewed as an investment in the future of an organization if employees are retained and continue to develop their knowledge and abilities. It contributes to the overall development of the organization as well the employees of the organization.

Suggestions and recommendations

From the present study researcher would suggest the following:

Training has its own importance with respect to development of skills and attitude of the delegates towards the guests of the hotels.

Training module should be efficiently planned by considering time and job profile of the employee.

Age plays an important role in speedy development. During the research it was found that maximum employees were aged between 20-30 years of age.

The corporate sector is expanding resulting in demand for the hotel industry hence, hotels should implement cross training which will result in growth of the employees.

It was noted that majority of the employees were aware of cross training so the hotel should implement the program of cross training over a certain interval of time.

Human Resource department should plan an effective training model according to the need and development of the employees as maximum employees felt the necessity of cross training in their working schedule.

The upper level staff should undergo cross training as they can train their employees very well under them. It is advised that Managers and Executives should be trained very well to make them efficient to train others.

It is recommended for the staff of Front office department to be very well versed with procedures and the standards of the hotel as they are the ones who will be interacting with the guests of the hotel for the first time.

The training module should be held for shorter duration like for 1 week where basic skills training program can be carried out and could be also for the longer duration for about 6 weeks where the employees can go for a periodic change of the department over a certain period of time.

Training modules like online training and Train the trainer should be put in work as it reduces time and labour. Employees can go online training after the shifts while training a single executive or a manager would be time effective.

During the period of cross training practices like lateral thinking, team building and shadowing should be followed as they are futile in increasing the capabilities of the employees as well as building a good and strong relationship among the upper level and junior level staff of the hotel.

Cross training is very much effective as well as efficient when it comes to saving the cost as well as time. It was also seen that it is good for business as it improves the working skills as well as marketability of the employees hence it is highly recommended that hotels should implement this program in an effective manner.

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Antimicrobial Pattern of Medicinal Oils against Bacterial Isolates

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Abstract

Antibacterial Potency of six medicinal oils, Eucalyptus, Clove, T-tree, Cinnamon, Menthol and Neem oil was determine by disc diffusion method and MIC by tube dilution method against species of ***Staphylococcus, E.coli, Proteus, Pseudomonas*** and ***Salmonella.*** Their inhibitory zone ranged from 15.00 mm. to 24.00 mm. Their minimum inhibitory concentrations ranged from 1:2 to 1:8. ***Staphylococci*** was found to be most sensitive organism with inhibitory zone ranged 16.00 to 24.00mm. and MIC 1: 4 to 1:8 in above oils. Whereas ***E.coli, Proteus, Pseudomonas*** and ***Salmonella*** were less sensitive with zone of inhibition ranging from 15.00 mm. to 22.00 mm. and MIC range 1:2 to 1:8. T-tree, Cinnamon and Clove oil were found to be more potent for Antibacterial activity.

Key words : inhibitory Zones, Minimum inhibitory concentration, T-tree and Tween20.

1. Introduction

Many essential oils possess powerful antibacterial activity and are used for aroma therapies. These are found to be inhibitory against skin & wound infecting flora[1,2,3]. Several food born pathogenic organisms are also found to be inhibited by many plant essential oils[4,5,6]. Many ayurvedic preparations used for skin infections are antimicrobial in nature. These oils also indirectly help to resists infections as powerful immunostimulants. Some key essential oils reported are Eucalyptus oil, Clove oil, Lemon grass oil, Olive oil, Silicon Oil, Cinnamon Oil, Amla Oil and sweet almond oil etc., ensuring efficacy against wide range of microorganisms[7,8]. Therefore, this area of research will have inter-disciplinary status in different fields of science like pharmacology, clinical medicine, microbiology and cosmetology etc.

2. Materials and Methods

2.1 Materials

i) M-H medium

M-H medium procured from HI-media, Mumbai. Prescribed amount of medium dissolved in 1000 ml of distilled water. Medium was thoroughly mixed and autoclaved at 121^0C and 15 lb pressure for 15 minutes. 25-30 ml of this medium was aseptically transferred into 9 cms petriplates to obtain a

depth of about 4 mm.

ii) Mc Farland turbidity standard

0.5 Mc Farland turbidity standard was prepared by adding 0.5 ml of 1.175% $Bacl_2$ solution to 9.5 ml of 1 % chemically pure sulphuric acid.

iii) Hi-Si test agar (M485A) and Hi-sensitivity test broth (M486)

Hi-Si test agar (M485A) and Hi-sensitivity test broth (M486) were procured from Hi-Media, Mumbai. The preparation of media was done strictly according to the instructions given in the literature provided.

iv) **Controls :** For comparison, the antimicrobial susceptibilities of isolates with standard culture according to the guidelines of **National Committee for Clinical Laboratory Standards, *Staphylococcus* ATCC 25923, *E.coli* ATCC 2592, *Proteus* ATCC 6380, *Pseudomonas aeruginosa* MTCC 741, *Salmonella* ATCC 6539** was included in the present investigation as control.

2.2 Methods

i) Determination of Antimicrobial Activity of Medicinal Oils by Disc diffusion Method. Antimicrobial activity of essential oils was determined by disc diffusion method as follows.

Bacterial cultures were grown in Mueller Hinton Broth for 18 Hrs. at 37^0c to get 10^6 cfu per ml. Population density was matched with McFarland standards. Plates were seeded with 0.5 ml inoculum of each bacterial strain in Mueller Hinton Agar. Disc were impregnated with 50 µl essential oil (Whatman No. 5, 5 mm diameter).All the plates were kept for 30 minutes at room temperature to allow diffusion of oil and then incubated for 18 hrs. at 37^0c. Zone of inhibition was measured for number of strains considered for the study and mean value was calculated for each oil against each organism.

ii) Determination of MIC of Medicinal Oils Against Bacterial Isolates

Based on determination of inhibitory zone, 6 different essential oils were found to have potent antibacterial activity were considered for MIC testing.The tube dilution method for National

Committee for clinical laboratory standards was used with modification . The dilutions of essential oils were made with Tween 20 oil. 10 µl inoculum was inoculated in each dilution tube with each organism. Inoculated tubes were incubated at 37^0c for 18 Hrs. Experiments were carried in triplicates. Inhibition of the growth in oil was judged by comparison with growth in blank control tubes.Dilutions used of essential oils were with Tween 20 oil were 1:2, 1:4, 1:8, 1:16, 1:32.

3. Results and Discussion

i) Determination of Anti-Bacterial Activity of Medicinal Oils against Bacterial Isolates by Disc diffusion Method

Table 1. Determination of Antibacterial activity of Medicinal Oils against bacteria by Disc Diffusion Method

S. No.	Organism	No. Isolates	Average Inhibition zone in mm. for Medicinal Oils					
			Euca-lyptus	Clove	T tree	Cinna-mon	Menthol	Neem
1	Staphylococci	20	16.00	18.00	24.00	18.00	18.00	16.00
2	E.coli	20	15.00	18.00	22.00	18.00	16.00	16.00
3	Proteus	20	15.00	19.00	23.00	17.00	17.00	16.00
4	Pseudomonas	20	15.00	18.00	22.00	17.00	15.00	16.00
5	Salmonella	20	17.00	19.00	21.00	18.00	15.00	17.00

Table 2. Studies on MIC of Medicinal Oils against bacteria by tube dilution Method

(All the dilutions were made with Tween 20 oil)
(MIC-Minimum Inhibitory Concentration)

S. No.	Organism	No. Isolates	Average Inhibition zone in mm. for Medicinal Oils					
			Euca-lyptus	Clove	T tree	Cinna-mon	Menthol	Neem
1	Staphylococci	20	1:8	1:8	1:8	1:4	1:4	1:4
2	E.coli	20	1:4	1:4	1:8	1:8	1:2	1:2
3	Proteus	20	1:4	1:4	1:8	1:4	1:2	1:2
4	Pseudomonas	20	1:4	1:4	1:8	1:8	1:2	1:2
5	Salmonella	20	1:4	1:4	1:8	1:4	1:2	1:4

Out of all six medicinal oil tested against Twenty isolates of ***Staphylococci***, for susceptibility by disc diffusion technique, the highest activity was shown by T tree (24.00 mm), followed by Clove oil (18.00 mm), Cinnammon Oil & Menthol Oil (18.00 mm), followed by Neem oil (16.00 mm) zone of inhibition (Table 1).

For twenty isolates of ***E.Coli***, the average inhibition zone by disc diffusion technique was found to be, with T tree oil (22.00 mm), Clove oil (18.00 mm), with Cinnamon oil (18.00 mm) with Menthol oil (16.00 mm) and with Neem oil (16.00 mm). However, Eucalyptus oil was found to be inhibitory with 15.00 mm diameter zone (Table 1).

For twenty isolates of ***Proteus*** against six medicinal oils, the susceptibility pattern by disc diffusion method observed was T tree oil to give best results (23.00 mm), followed by Clove oil (19.00 mm), followed by Menthol oil (17.00 mm), followed by Cinnamon oil (17.00 mm) followed by Neem oil (16.00 mm, followed by eucalyptus (15.00 mm) diameter zone. (Table 1).

When six medicinal oil tested against twenty isolates of ***Pseudomo-***

nas, T tree oil had shown highest activity with inhibition zone (22.00 mm), followed by Clove oil (18.00 mm), followed Cinnamon Oil (17.00 mm), followed by Neem Oil (16.00 mm), followed by Menthol Oil & Eucalyptus Oil (15.00 mm) (Table 1).

Out of six medicinal oils tested for anti-microbial activity by disc diffusion technique against twenty isolates of ***Salmonella*** species, the highest activity was shown by T tree oil with inhibition zone diameter (21.00 mm), followed by Clove oil (19.00 mm), followed by Cinnamon Oil (18.00 mm), followed by Neem and Eucalyptus oil (17.00 mm), followed by Menthol oil (15.00 mm) (Table 1).

ii) Studies on MIC of Medicinal Oil against Bacterial Isolates

The present research work was carried to study ***invitro*** anti-microbial effect on drug resistant bacterial isolates. In the present investigation total six medicinal oils were tested against five different groups of bacteria eg. ***Staphylococci, E.coli, Proteus, Pseudomonas*** and ***Salmonella.***

The minimum inhibitory concentration by tube dilution method was studied against twenty isolates of ***Staphylococci*** [9,10] and the mean MIC observed was 1 : 8 for Clove oil, T tree oil and Eucalyptus oil, whereas for Cinnamon, Menthol and Neem oil it was 1 : 4. (Table 2).

For twenty isolates of ***E.coli*** , the mean MIC for T tree oil and Cinnamon oil was observed to be 1:8,. Whereas for Eucalyptus and Clove oil it was 1:4. However, Menthol and Neem oil were observed as 1:2 dilution for MIC (24 hours) (Table 2).

For twenty isolates of ***Proteus***, MIC for tube dilution technique for 24 hours, was observed for T tree oil was 1:8. Eucalyptus, Clove and Cinnamon were shown to have 1:4 MIC. While Neem gave mean MIC Values 1:2 (Table 2).

For twenty isolates of ***Pseudomonas***, mean MIC values of T tree and Cinnamon oil for tube dilution technique with 24 hours incubation period was found to be 1:8 , while Eucalyptus and Clove oil were having MIC 1:4. Menthol and Neem showed 1:2 dilution MIC values[11,12]. (Table 2)

For twenty isolates of ***Salmonella***, T tree oil showed MIC values 1:8, while Clove, Eucalyptus, Cinnamon and Neem gave 1:4 dilution. Whereas MIC for 24 hours for Menthol oil was found to be 1:2 (Table 2).

In the above results it is observed that, for Gram positive bacteria like ***Staphylococci***, T tree, Clove, Cinnamon & Menthol Oil have shown higher anti-microbial potential. For Gram negative bacteria like ***E.coli, Proteus, Psuedomonas and Salmonella*** species, T tree oil and Clove oil gave the best results.

4. Conclusion

Good inhibitory effects with wider zone of inhibition were obtained with Gram positive bacteria like ***Staphylococci*** with six different medicinal oils. Comparatively antimicrobial zones

were lesser with Gram negative group of bacterial isolates like ***E.coli, Proteus, Pseudomonas*** and ***Salmonella***. In the present investigation minimum inhibitory concentrations for hundred antibiotic resistant isolates from five different groups of bacterial (twenty isolates of each) was determined for six different medicinal oils. Good (lower) MIC was observed for Gram positive bacteria like ***Staphylococci*** while for Gram negative isolates like ***E.coli***, ***Proteus, Pseudomonas*** and ***Salmonella***, it was comparatively higher. It can be concluded from MIC data that medicinal oils are effective against multiple antibiotic resistant bacterial isolates.

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Awareness about Plastic Pollution among Undergraduate Science Students

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Abstract

The present study was conducted to evaluate awareness about plastic pollution among the students of science faculty. It was also aimed to extract ideas from the students to curb plastic pollution. The main focus of this study was to judge knowledge and its application regarding major threat of plastic pollution.

Key words : plastic pollution, awareness, knowledge, science students.

1. Introduction

The last few decades has seen steady rise in the use of plastic products resulting in disproportionate increase in the municipal solid waste streams in all major cities of the world.[1] The plastic has almost replaced traditional cultural packaging methods and materials like leaves, paper bags, jute bags, brown paper etc.[2] The popularity in the use of plastic is due to its inertness, flexibility and versatility.[3] The excessive use of plastic virtually chokes the drainage system in urban and rural areas. It was noted by Daily Graphic of 16 March 2005 that subsaharan cities of Africa showed flood-like situation within two hours of heavy rain due to choked drain-systems.[4] It has been found that the basic knowledge of environment pollution and its hazards are known to the general public. The school children are also aware of these problems. Ramsey et al[5] showed that environmental awareness is the first major step in preparing people to solve environmental problems. Considering this background a study was conducted among the undergraduate students for assessing awareness about plastic pollution and their willingness to protect the environment. The students were given questionnaire based on plastic pollution, types of plastic and use of plastic. They were also asked to suggest various ways to curb plastic pollution.

2. Materials and Methods

A questionnaire based survey was designed to judge the knowledge of students regarding pollution.[6] All the students were from undergraduate science faculty only having various subjects like Botany, Zoology, Physics, Chemistry, Mathematics, Computer Science, Microbiology, Biochemistry and Biotechnology. They were from three institutes under Rashtrasant Tu-

kadoji Maharaj Nagpur University, Nagpur (Maharashtra). The questionnaire was distributed between the months of July to September 2015. The participants were selected irrespective of their sexes, family background, financial status and parents' education. All the participants were between the age group of 20-22.

The first section of the questionnaire was based on general environmental knowledge which has five questions without multiple choice. The second section was related to types of plastic and third section had questions on resin codes. The fourth section was on the topic of recycleable and non-degradable plastic.The fifth section had two question one was based on alternatives to be used in the place of plastic and second question was based on suggestions to control plastic pollution.

3. Results and Discussion

The questionnaire was divided into various sections and from these sections few topics had been taken into consideration in this case. The total number of participants were 300. Among them the percentage of girls' participation was 75% as one of the institutes was totally a girls' college and boys participation was 25% only. This was shown in Table No.1 and Figure No.1.[7]

Table 1. College with Gender

	LAD	SFS	IOS
Male	0	45	30
Female	130	80	15

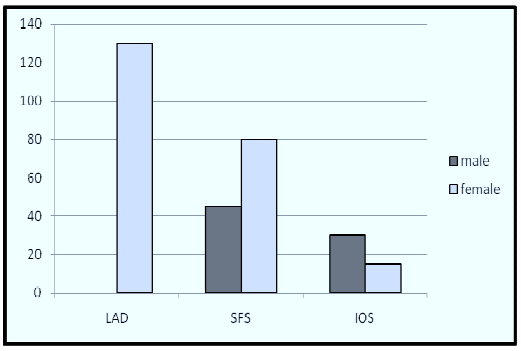

Fig 1. Gender distribution

Table 2. Colleges with Subjects

H_{01}: There is no significant difference in scores between different combination of colleges.

H_{02}: There is no significant difference in scores between different combination of subjects.

	Chemistry	Non chemistry
LAD	83	47
SFS	108	17
IOS	36	9

Colleges with percentage		
	Chemistry	Non Chemistry
LAD	63.85%	36.15%
SFS	86.40%	13.60%
IOS	80%	20%

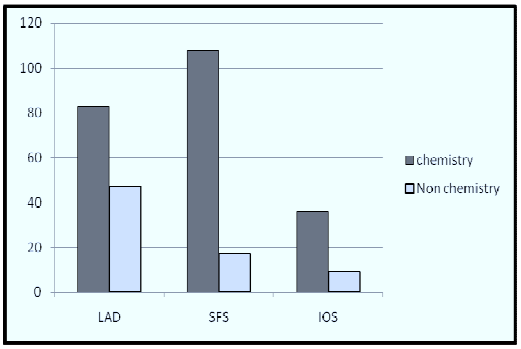

Fig 2. College with subjects

1. As P value > 0.05, We accept H_{01} at 5% L.O.S

   Therefore, there is no significant difference in scores between different combination of colleges.

2. As P value > 0.05, We accept H_{02} at 5% L.O.S

   Therefore, there is no significant difference in scores between different combination of subjects.

A curious pattern was seen when the participants were asked to suggest alternative for plastic. The 51.66% students failed to answer this question. Others suggested the use of paper bags, jute bags, recycled bags, use of electronic devise for data storage and eco-friendly bags. This is revealed in Fig. 3 and Table 3.

Table 3. Creative (Innovative) Ideas by Students

Alternatives with scores	
Alternatives	No. of students
Paper bags	54
Jute or home made bags	53
Metal or glass	4
Reuse of plastic bags	27
Electronic devise	5
Eco friendly plastic bags	2
No alternatives	155

4. Conclusion

The participants from different background and various subjects for their study had awareness about environment and pollution. But when it comes to applying their knowledge, it was noted that they lack this application tactics.

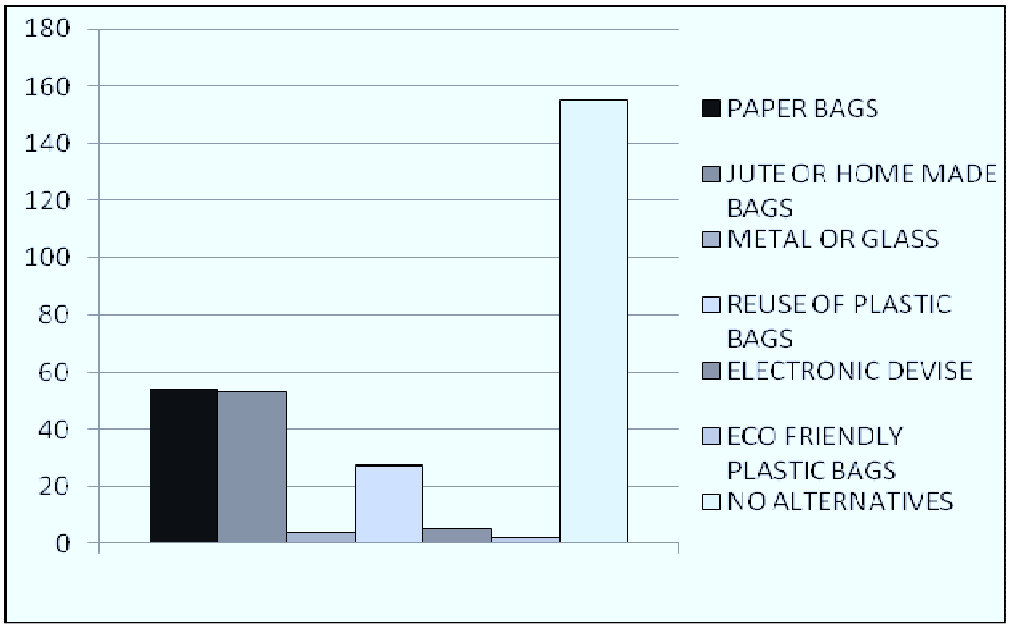

Fig 3. Showing Innovative ideas presented by the students

The result suggest more attention needs to be paid to provide the basic environmental information. This can be done through various audio-visual aids. The active participation of students will also help to design strategy for the control of pollution.

The study will also provide baseline information on environmental issues and attitude of the students. This will also help our government to frame its policies regarding education at early stage of school-life about environment.

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Gender Outlook in Enrollment of Undergraduate Physics Courses in Nagpur University

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Abstract

In Pre-independence period only rich and upper caste society had access to education. During that period many social reformers like Mahatma Jyotiba Phule fought for right to girls' education for other strata of society. After independence many Acts were passed to promote education, basically the primary education which was made free up to the age of 14. Recent studies show that Engineering and medicine are the 1st choice as it provides lucrative jobs and better social life as compared to basic sciences. The present paper is a study on the role of gender in the choice of Physics as a subject in undergraduate courses of the Nagpur University region.

Key words : Girl's education, Science education, Physics enrollment, undergraduate courses.

1. Introduction

For a long time struggle goes on for the growth of girl education. Social reformers like Jyotiba Phule, Savitribai Phule and others tried hard to bring girl education during British rule in India, as the education was accessible to only rich and upper castes of society. The overall literacy rate for women increased from 0.2% in 1882 to 6% in 1947 in India. Path breaking step towards growth of female education was taken under 86th constitutional Amendment Act 2002. According to this Act, elementary education is a fundamental right for children between ages 6 and 14 and made free for them. Education in India is provided by the public as well as the private sector. It falls under the control of both the Union and State governments. Most of the universities in India are controlled by the Union or the State governments.

2. Methodology

Rashtrasant Tukdoji Maharaj Nagpur University (RTMNU) was established on 4th August 1923. Colleges from Nagpur city, Wardha, Kamptee, Katol, Gondia, Bhandara are some of the regions which are affiliated to RTMNU. RTMNU offers courses in various disciplines like Arts, Commerce, Science, Engineering, Medicine etc. Our study is mainly related to Science Faculty. Under RTMNU, Bachelor of Science (B.Sc.) degree course is of 3 years where combinations of three subjects should be selected by the students. For our study

we categorized it as non-physics and physics group. Under physics group combination of physics with chemistry, mathematics, electronics, statistics or computer science can be taken by students. More than 20 Science Colleges are attached to RTMNU. Our study is to co-relate women's enrolment for physics subject in this region. For this study 4 renowned colleges from urban & rural areas are considered. From four colleges one is Ladies College, two are science colleges and one is multi-faculty college. Data is collected for last five years starting from 2009 to 2014.

3. Results

Analysis of multi-faculty college is shown where it is seen that Science admissions are comparatively less than total admissions. Girl's admissions are equal with boys in Physics. % of girls opting Physics is nearly constant over the period of the study.

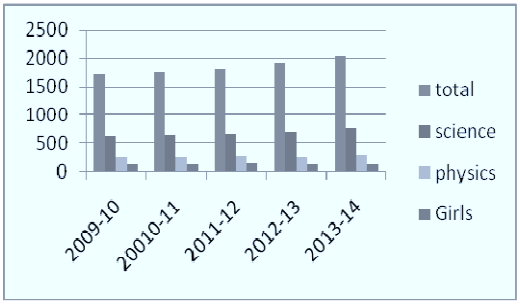

Fig 1. Multi Faculty College

Rural and urban science colleges shows that percentage of girls opting physics is increasing from 2009-14.

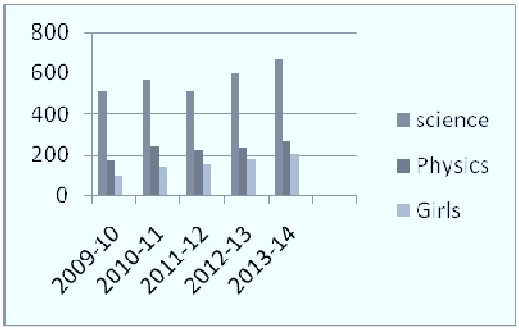

Fig 2. Rural Co-ed Science College

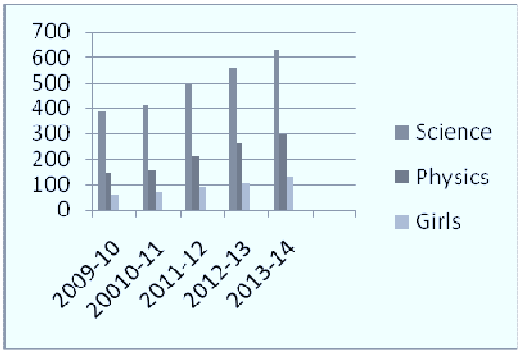

Fig 3. Urban Co-ed Science College

Ladies Science College is also studied. A steady increase in Physics enrollment can be seen from 2009 to 2014.

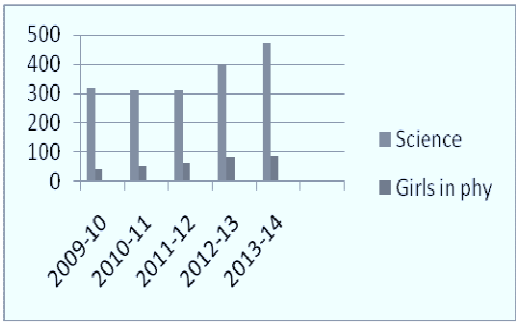

Fig 4. Ladies Science College

From the above data, considering only girl's enrollment for last five years as shown in the following chart, a nearly 75% rise in total enrollment of girls in physics can be seen.

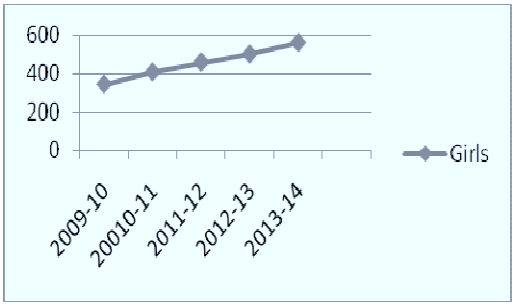

Fig 5. Girls Enrollment

4. Conclusion

From the analysis it is seen that in multi faculty Co-ed college girl's enrolment in physics is nearly constant for five years whereas girls enrollment in rural and urban Co-ed science college and ladies college is steadily increasing from 2009-14. This is also shown collectively in last chart where enrolment of girls in physics is increased 75% in last 5 years.

Acknowledgement

Authors acknowledge the Authorities of participating colleges who provided data for the study.

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Environment Sustainability in Textiles, Clothing and Fashion

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Abstract

Sustainable fashion, also called eco fashion, is a part of the growing design philosophy and trend of sustainability, the goal of which is to create a system which can be supported indefinitely in terms of environmentalism and social responsibility. Sustainable fashion is a detail on the bigger picture of a general movement towards creating more sustainable, environmentally friendly and ethical products. It's no longer just a trend to follow, but the mark of a positive shift for a new generation of consumers. Therefore, sustainable fashion is the best way to make a responsible lifestyle look good and feel even better. Only a few of the sustainable textile fabric choices on the market these days, although they are among the more favored by consumers. Under the accordance of sustainability, recycled clothing upholds the principle of the "Three R's of the Environment": Reduce, Reuse, and Recycle, as well as the "Three Legs of Sustainability": Economics, Ecology, and Social Equity. The eco fashion movement, on a small or large scale, is about drawing the connections between consumers and their clothing.

Key words : Eco fashion, Sustainable, Clothing.

1. Introduction

Eco fashion is a detail on the bigger picture of a general movement towards creating more sustainable, environmentally friendly and ethical products. It's no longer just a trend to follow, but the mark of a positive shift for a new generation of consumers. We believe that positive change can happen if we all think differently about fashion and demand better. We want a cleaner, safer, fairer, more transparent and more accountable fashion and textiles industry. We want fashion to become a force for good. We believe in an industry that values people, the environment, creativity and profit in equal measure.[1]

As an answer to growing demand, more companies and designers are using the power of fashion to inspire a change in the industry, create awareness, and promote conscious consumption. There's a whole spectrum of eco criteria that contributes to this new type of fashion, from compassionate and ethical production to the use of organic, recycled and other materials that reduce negative environmental impact. There is still a long way to go, but we are on the verge of a sustainable fashion revolution, and Vision Tex-

tiles is a part of it. Fashion is not limited to our wardrobes; it penetrates every aspect of life. Therefore, sustainable fashion is the best way to make a responsible lifestyle look good and feel even better.[2]

2. Sustainable Textile fabrics

The materials Synergy uses represents only a few of the sustainable textile choices on the market these days, although they are among the more favored by consumers. While there are serious **environmental impacts** associated with many fabrics there are some whose impact is much less. Some of the latest sustainable textile fabrics are as follows.[3]

Organic cotton

Organic cotton is grown without chemicals and therefore does no harm to either environment or workers but is necessarily more labour intensive and furthermore fields must be free of chemicals for three years before the crop can be certified organic. There have been huge global increases in the demand for organic cotton and the problem now facing farmers is producing enough to meet the demand. Organic cotton garments are likely to be free from chlorine bleaches and synthetic dyes.[4]

Hemp

Hemp has been touted as the ultimate eco-friendly fabric because it requires no chemicals to grow. It's also extremely versatile, and can be used to create strong, sturdy fabrics – even rope - or soft, delicate items .Hemp has many excellent properties being environmentally positive with no need of pesticides and insecticides it actually improves soil where it is grown. It is drought resistant and can be grown in most climates. Textiles can also be processed from the fibrous stalks without the use of toxic chemicals and because it does not require high technology to process it is ideal to be processed locally increasing local employment and saving transport costs and pollution. Hemp has been used to make clothing for thousands of years and it is produced in Europe and Asia and is now legal in Canada. It is highly sustainable textile.

Bamboo

Bamboo is the latest plant material to hit the eco-friendly fabrics market. It is described as hypoallergenic, absorbent, fast-drying and naturally antibacterial and comes from a very fast-growing plant. Bamboo is a material whose luxurious softness has been compared to cashmere. As a plant it is fast growing and highly sustainable and is mainly naturally organic.. Bamboo fabrics can be produced without any chemical additives.[5]

Soya

This fabric is renowned for its softness, comfort, luster and drape combined with wash ability and durability. It is more expensive than organic cotton or hemp at this time and is seen as a new luxury product. One of the positives being talked about is the

fact that the cloth is produced from a by product of food manufacturing of the Soya bean. Some Soya has organic certification but it is a small percentage.

Lyocell : This is the generic name for the Tencel brand. It's made from wood pulp, so it's both biodegradable and recyclable. Producing this fabric involves less emissions, energy, and water usage than other more conventional fabrics, and it doesn't get bleached, either. Plus it's naturally wrinkle-free.

Cashmere : As anyone who has ever caressed a cashmere cardigan knows, the fabric is luxurious. The fibre comes from combing out the under-hairs of Kashmir goats, a breed native to the Himalayas but now raised worldwide. Perhaps best of all from en eco-perspective, it's also long-lasting. However, It may also be blended with other fibres, such as polyester.

Alpaca : Alpaca sheep don't require insecticides to be injected into their fleece, are fairly self-sufficient, don't need to be treated with antibiotics, and don't eat very much. It seems they've taken the idea of being eco-friendly upon themselves! Alpaca wool is also long lasting,

Ingeo : This is a new fabric made from fermented plant sugars, usually derived from corn. This is actually one of its pitfalls; since conventionally grown corn leaves a particularly large eco-unfriendly footprint via pesticides, water use, and land hogging. But making Ingeo requires almost half as much energy as it does to make cotton, even organic cotton, which gives it some advantages.

Linen is made from flax, another traditional fibre crop which needs few chemical fertilisers, and less pesticide than cotton.

Organic wool is increasingly becoming available: it is produced using sustainable farming practises and without toxic sheep dips. They supply knitting kits and spun wool.

Recycled polyester Look out for full-on, hi-tech fleece jackets made from recycled drinks bottles, e.g. Outdoor gear company VauDe's Ecolog range is both recycled and fully recyclable – everything, down to the zips and buttons, is 100% polyester.

Eco friendly clothing are clothes that can not harm our environment and are made of green materials. Since our clothing is made out of fabric, the fabric can be very harmful to our environment. Fabric can be harmful to us because of the chemicals that the farmers are using.

Sustainable clothing refers to fabrics derived from eco-friendly resources, such as sustainably grown fiber crops or recycled materials. It also refers to how these fabrics are made. Historically, being environmentally conscious towards clothing meant (1) buying clothes from thrift stores or any shops that sell second-hand clothing, or (2) donating used clothes to shops, for reuse or resale. In modern times, with a prominent trend towards sustainabili-

ty and being ‘green’, sustainable clothing has expanded towards (1) reducing the amount of clothing discarded to landfills, and (2) decreasing the environmental impact of agro-chemicals in producing conventional fiber crops (e.g. cotton). Under the accordance of sustainability, recycled clothing upholds the principle of the “Three R’s of the Environment”: Reduce, Reuse, and Recycle, as well as the “Three Legs of Sustainability”: Economics, Ecology, and Social Equity.

Through the utilization of recycled material for the manufacturing of clothing, this provides an additional realm of economic world profit. Sustainable Clothing will provide a new market for additional job opportunities, continuous net flow of money in the economy, and the reduction of raw materials and virginresources. Source reduction or reducing the use of raw materials and virgin resources can ultimately reduce carbon emissions during the manufacturing process as well as the resources and carbon emissions that are related to the transportation process. This also prevents the unsustainable usage of extracting materials from the Earth by making use of what has already been used (i.e. recycling).

Sustainable fashion

Sustainable fashion, also called eco fashion, is a part of the growing design philosophy and trend of sustainability, the goal of which is to create a system which can be supported indefinitely in terms of environmentalism and social responsibility. Sustainable fashion is part of the larger trend of sustainable design where a product is created and produced with consideration to the environmental and social impact it may have throughout its total life span, including its "carbon footprint". According to the May 2007 Vogue, sustainable fashion "does not appear to be a short-term trend but one that could last multiple seasons, the very word season being up for grabs in a climate-affected world".while environmentalism used to manifest itself in the fashion world through a donation of percentage of sales of a product to a charitable cause, fashion designers are now re-introducing eco-conscious methods at the source through the use of environmentally friendly materials and socially responsible methods of production.[6]

Indian Origin Designers Turn to Sustainable Fashion

There are some emerging breed of young, forward-thinking Indian designers whose work goes beyond beautiful design and highlights the attention to fair practices, social responsibility and environmental sustainability - elements that truly set their creations apart.

a) Anupama Dayal

Her fashion label ‘Anupamaa‘ is synonymous with its philosophy of being wholly organic. With her vibrant prints, Dayal attempts to revive ancient hand-printing, dyeing and needle-craft techniques. Her creations use vegetable dyes and hand carved wooden

blocks prepared by master craftsmen and undergo natural processes of colouring and drying.

b) Siddhartha Upadhyaya

The Label uses award winning eco-friendly DPOL (Direct Printing On Loom) technology Using DPOL, there is very little garment wastage, minimal use of chemicals and the saving of a lot of labour cost and. effectively. money. one can produce ready to stitch shaped woven garment components. These components are finished at the edges by selvedge. This considerably increases fabric efficiency by approx 15%-22% and reduces lead time by approx 50%. The DPOL technology can be used to manufacture high quality fashion garments

c) Sheena Matheiken

Sheena, who was born in Ireland and raised in India and is famous for her 'Uniform Project', tries to promote re-use and ethical fashion. She hopes her efforts would encourage smart designers to launch ethical collections, with support from informed consumers. Sheena adds, "It would make sustainability the norm rather than the exception."She took the challenge of wearing one dress for 365 days. She used to wear the same dress differently (sometimes even wearing it inside out!), with different accessories and it looked different everyday. It turned out to be a huge success with people getting inspired.

d) Shalabh And Anita Ahuja

Shalabh and Anita Ahuja, through their initiative, Conserve, are dedicated to the cause of fashion, with a cause. This socially and environmentally responsible enterprise is refashioning waste into lifestyle products for Western markets, empowering in the process, vulnerable rag-picker communities in India and keeping waste off the streets and away from the landfills. Conserve has patented an energy efficient, dye-free upcycling process whereby plastic waste is turned into Handmade Recycled Plastic (HRP), which a team of trained individuals from lower socio-economic backgrounds model into bags, jewellery, and belts for the global market.

e) Swati Argade, USA

This Indian American designer uses hand woven fabrics and has a signature style of mixing ethnic and bohemian aesthetics that is transformed into an urbane looking collection. She chooses fabrics and dyes consciously keeping sustainability as a priority.

Swati also goes for recycling, repurposing and upcycling, but firmly believes that the design is paramount and there should be no excuse to compromise on it. Last year, she launched a collection of coats made from recycled bottles and organic cotton under her 'Bhoomki' collection.[7]

3. Conclusion

The fashion and textiles supply chain can have a lasting global impact

– both social and environmental. By looking further back along this chain and exploring the very fibres your fabrics are made of, we can reach a greater understanding of what needs to be done to improve the way we create, design, buy, wear, use, and value fashion and textiles. In addition to promoting a sounder environment by producing newer clothing made with sustainable, innovative materials, clothing can also be donated to charities, sold into consignment shops, or recycled into other materials. Sustainably made designer fashions will continue to attract a growing niche market, but these larger corporate initiatives are the kind that can create lasting change in the marketplace. So consumers will know if the clothes they are purchasing meet their social and environmental standards. The more consumers know about the content of their clothing, the more they may begin to see it in all of its "lifecycle," from grower to garment. The eco fashion movement, on a small or large scale, is about drawing the connections between consumers and their clothing.

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Diabetes Mellitus in India : Dimensions, Determinants, Dynamics and Directions for Public Health Action

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Abstract

Diabetes Mellitus being panmetabolic disorder is characterized by alteration in lipid profile. Although diabetes and hyperlipidemia represent different genetic disorders, each of these disorders is common in the general population and the two disorders may co-exist in the same individual. The main types of diabetes are type 1 and type 2 diabetes. Type 1 diabetes results from an irreversible loss of pancreatic β cells and type-2 diabetes is primarily caused by impaired insulin action. At present, dyslipidemia is most commonly treated with drug therapy. However, because safety concerns regarding the use of pharmaceutical agents have arisen, a need for alternative nonpharmacological therapies has become increasingly apparent. The National Cholesterol Education Program (NCEP) Adult Treatment Panel III (ATP III) recommends lifestyle therapies, which include a combination of diet and exercise modifications, in place of drug treatment for patients who fall into an intermediate range of coronary heart disease (CHD) risk. Rapid pace of economic and demographic changes in India has ushered marked nutritional and lifestyle changes. The diets in the urban and semi-urban areas contain more calories and saturated fats, and less fibre as compared to the traditional frugal diets and have become similar to diets consumed by the people living in the developed countries. The dietary globalization, seen predominantly in the major cities in India, is now gradually spreading to the rural areas. Increasing urbanization and mechanization have also resulted in increase in sedentary lifestyle. The children and adolescents are highly susceptible to acquire such unhealthy lifestyle changes. Overall, obesity and the metabolic syndrome are becoming increasingly prevalent in adults and disquietingly, in children and adolescents in the urban areas of India. These changes are conducive to development of early-onset type 2 diabetes mellitus and accelerated atherosclerosis. It is particularly important to effectively implement and strengthen population-based primary prevention strategies for the prevention of 'epidemic' of obesity and the metabolic syndrome in India. A more aggressive approach to prevention and treatment of both conventional and emerging risk factors is warranted. Although coronary artery disease is a fatal disease, it is also highly predictable, preventable, and treatable with the existing knowledge.

Key words : Diabetes Mellitus (DM), Dyslipidemia, Type 1 & Type 2 Diabetes

1. Introduction

The worldwide prevalence of DM has risen dramatically over the past two decades, from an estimated 30 million cases in 1985 to 285 million in 2010. Based on current trends, the International Diabetes Federation projects that 438 million individuals will have diabetes by the year 2030. Diabetes mellitus (DM) refers to a group of common metabolic disorders that share the phenotype of hyperglycemia. Several distinct types of DM are caused by a complex interaction of genetics and environmental factors. Depending on the etiology of the DM, The metabolic dysregulation associated with DM causes secondary pathophysiologic changes in multiple organ systems that impose a tremendous burden on the individual with diabetes and on the health care system[1].

Type 2 diabetes mellitus (DM) is a chronic metabolic disorder in which prevalence has been increasing steadily all over the world. As a result of this trend, it is fast becoming an epidemic in some countries of the world with the number of people affected expected to double in the next decade due to increase in ageing population, thereby adding to the already existing burden for healthcare providers, especially in poorly developed countries[2].

Diabetes mellitus is reaching potentially epidemic proportions in India. The level of morbidity and mortality due to diabetes and its potential complications are enormous, and pose significant healthcare burdens on both families and society. Worryingly, diabetes is now being shown to be associated with a spectrum of complications and to be occurring at a relatively younger age within the country. In India, the steady migration of people from rural to urban areas, the economic boom, and corresponding change in life-style are all affecting the level of diabetes. Yet despite the increase in diabetes there remains a paucity of studies investigating the precise status of the disease because of the geographical, socio-economic, and ethnic nature of such a large and diverse country[3].

2.1 Causative factors of Diabetes

Type 2 DM is primarily due to lifestyle factors and genetics. A number of lifestyle factors are known to be important to the development of type 2 DM. These are physical inactivity, sedentary lifestyle, cigarette smoking and generous consumption of alcohol. Obesity has been found to contribute to approximately 55% of cases of type 2 DM. The increased rate of childhood obesity between the 1960s and 2000s is believed to have led to the increase in type 2 DM in children and adolescents. Environmental toxins may contribute to the recent increases in the rate of type 2 DM[2].

2.2 Diabetes and its associated complications

DM if left untreated diabetes can lead to serious problems like macrovascular and microvascular complications. The microvascular complications include retinopathy, nephropathy, and

neuropathy (both distal polyneuropathy and autonomic neuropathy) while the macrovascular complications of diabetes include angina, myocardial infarction, transient ischemic attack, and stroke[1].

2.3 Diabetes and cardiovascular disease

Patients with DM have a 2- to 4-fold increased risk of cardiovascular, peripheral vascular and cerebrovascular disease, which are the leading causes of morbidity and mortality in this population. Many Western epidemiological studies have shown an association between diabetic dyslipidemia, which is characterized by hypertriglyceridemia; low levels of HDL cholesterol; postprandial lipemia and small, dense LDL cholesterol particles and the occurrence of cardiovascular disease[4].

2.4 Targeted lipid values- by ADA

Diabetes is commonly associated with abnormalities in plasma lipids and lipoprotein levels commonly referred to as "dyslipidemia" .about 50% of all diabetic patients have dyslipidemia. Lipid abnormalities are more common in type 2 diabetes than in type 1 diabetes. Individuals with DM may have several forms of dyslipidemia. The most common pattern of dyslipidemia is hyper triglyceridemia and reduced HDL cholesterol levels. DM itself does not increase levels of LDL, but the small dense LDL particles found in type 2 DM are more atherogenic because they are more easily glycated and susceptible to oxidation. According to guidelines of the ADA and the American Heart Association, the target lipid values in diabetic individuals (age >40 years) without cardiovascular disease should be as follows: LDL < 2.6 mmol/L (100 mg/dL); HDL >1 mmol/L (40 mg/dL) in men and >1.3 mmol/L (50 mg/dL) in women; and triglycerides 40 years, the ADA recommends addition of a statin, regardless of the LDL level in patients with CHD and those without CHD, but who have CHD risk factors[1].

2.5 Anthropometric Indices

Waist and hip circumference were reported to be important predictors for the metabolic syndrome[5] Independent and opposite associations of waist and hip circumference with diabetes, dyslipidemia and less strongly with hypertension in a large population-based survey were mentioned and it was suggested that both be considered in epidemiological studies. These results emphasized that the associations were consistent in all age groups, except in age ≥75 y.

2.6 Hyperlipidemia

High incidence of hyperlipidemias among uncontrolled diabetic patients was reported in one study[1], but, there was no significant correlation between the duration of diabetes and the tendency for abnormal lipid profile pattern. In both Type 1 DM and Type 2 DM groups the serum triglycerides showed a significant elevation. The serum total cholesterol and serum LDL

cholesterol also showed a definite elevation. The serum HDL cholesterol showed a decrease in both Type1DM and Type 2 DM patients.

2.7 Diet

The recent report[6] highlights the rather dramatic differences in the effects of carbohydrate restricted (CR) and low fat (LF) diets on the lipid changes that may predispose to atherosclerosis. By first implementing weight maintenance diets of different compositions followed by calorie reduction, the authors show that significant improvement in atherogenic lipid states (lower TAG, higher HDL, lower apoB/apoA-1) can be brought about by CR even in the absence of weight loss or in the presence of higher saturated fat. When weight loss was further implemented in the CR groups, there was little further improvement in most markers although HDL continued to increase on calorie reduction. The LF diet, in distinction, required weight loss for effective improvement in the lipid profile, and the additive outcome of diet change and calorie reduction were not as effective as in the CR diets. Significant findings in a study[7] showed that both total carbohydrates and dietary glycemic load intake are inversely associated with plasma HDL-C concentrations among Asian Indians, with dietary glycemic load having a stronger association.

2.8 Prevention

Type 2 DM is a metabolic disease that can be prevented through lifestyle modification, diet control, and control of overweight and obesity. Novel drugs are being developed, yet no cure is available in sight for the disease, despite new insight into the pathophysiology of the disease[2].

Through lifestyle and diet modification, studies have shown that there was significant reduction in the incidence of type 2 DM with a combination of maintenance of body mass index of 25 kg/m^2, eating high fibre and unsaturated fat and diet low in saturated and trans-fats and glycemic index, regular exercise, abstinence from smoking and moderate consumption of alcohol[8]. Suggesting that majority of type 2 DM can be prevented by lifestyle modification. Patients with type 2 DM should receive a medical nutrition evaluation; lifestyle recommendations should be tailored according to physical and functional ability[9].

3. Conclusion

Because of the additive cardiovascular risk of hyperglycemia and hyperlipidemia, lipid abnormalities should be assessed aggressively and treated as part of comprehensive diabetes care. Clinicians may be targeted to facilitate the implementation of screening and early detection programmes, diabetes prevention, self-management counseling, and therapeutic management of diabetes in accordance with the appropriate local guidelines. Early screening and detection of pre-diabetes (especially in pregnant women, children and adults with BMI $\geq$25) may yield positive health outcomes in society. Ag-

gressive clinical measures in terms of early insulin initiation combined with optimal doses of oral hypoglycaemic agents and appropriate lifestyle modification could also have long-term positive effects in disease management. Management should be tailored to improve the quality of life of individuals with type 2 DM.

To reduce the disease burden that diabetes creates in India, appropriate government interventions and combined efforts from all the stakeholders of the society are required. Government policies may help in creating guidelines on diabetes management, funding community programmes for public awareness about the diabetes risk reduction, availability of medicines and diagnostic services to all sections of community, right from grass root level.

Education of the populace is still a key to the control of this emerging epidemic. Given that the disease is highly visible across all sections of society within India, there is now the demand for urgent research and intervention - at regional and national levels.

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Transformer Design Optimization

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Abstract

With the fast-paced changing technologies in the power industry, new references as well as new technologies are coming to the market. Based on this fact, there is an urgent need to keep track of research activities taking place in the field of modern transformer design. This article presents an extensive survey of current research in the field of transformer design which are dealing with problems like bushing failure, stray losses, eddy current loss and also bringing forward new ideas in design. It is based on over 15 articles published in the past 8 years. The different methods, materials used in transformers, and other relevant aspects for every article are discussed and presented.

Key words : Transformer, stray losses, leakage flux, core material, hot spots.

1. Introduction

Transformer design is a complex task in which engineers have to ensure that compatibility with the imposed specifications is met, while keeping manufacturing costs low. Transformer design optimization is a minimization of the cost of materials and losses. Manufacturers use cost optimization techniques during the design phase to minimize material costs and satisfy the utility's loss evaluation requirement. Every transformer must meet performance requirements without damaging itself or the surrounding system when abnormal events occur. Distribution transformers are responsible for approximately one third of the electric system losses. Therefore, great effort has been directed to increasing the efficiency of transformers and consequently reducing the losses and hence, the operational costs. With this background, the aim, methodology and results of 15 papers are discussed below, covering many design techniques which can be brought to practical application in the future.

The root causes of the bushing failures of the 132/33 kV, 125 MVA transformers at JBB Ali Grid station were analysed and some recommendations came up that will help in rectifying the problem. The analysis includes inspection of the failed bushings, comprehensive power quality measurements, frequency scan, and OLTC daily operations. Based on the results it was concluded that the bushing failures were due to a local internal degradation of the bushing insulation. This has been confirmed by analyzing the

time interval between successive OLTC operations of the faulty grid transformers. Monitoring the number of OLTC operations can help in predicting bushing failure when it exceeds a threshold value of number of operations per day or a monthly average of operations.[1]

The iron loss and manufacturing cost of a strip-wound core can be reduced by constructing the wound core with a combination of average and high magnetization grade steel.[2] It introduces a two-dimensional finite element (2D FEM) package for the flux density distribution and iron loss computation. Standard magnetization steel for the inner and outer sheets of the wound core, and high magnetization, low loss grade steel for the rest part of the core. The accurate computation of the iron loss and flux density distribution of this core is vital for determining the core's optimum geometric parameters that ensure the minimization of its first cost and future iron losses.

A comparison of a 1000 kVA three-phase, low-frequency distribution transformer (LFT) and an equally rated Solid-State Transformers (SSTs), was reported,[3] with respect to volume, weight, losses, and material costs, where the corresponding data of the SST is partly based on a full-scale prototype design. As for AC/AC applications, the SST benefits with respect to volume, but is significantly less efficient and has at least five times higher material costs. However, SST-based solutions can clearly outperform conventional transformers plus LV rectifier systems in modern AC/DC applications, achieving about half the losses and one third of the weight and volume, respectively. The SST technology has great potential in Smart Grid applications and becoming a reality in the future, meeting the requirements in terms of flexibility, intelligence and controllability.

A paper presenting equations regarding calculation of leakage inductance, self-capacitance and AC resistance in different transformer winding architectures (TWAs).[4] The analytical results are evaluated experimentally and through FEM simulations. Different transformer winding architectures were investigated in terms of the losses caused by the transformer for a bidirectional high-voltage (1500 V) flyback converter used to drive a dielectric electro active polymer (DEAP) based incremental actuator. The investigation clearly shows that TWAs

PERFORMANCE CHARACTERISTICS OVERVIEW

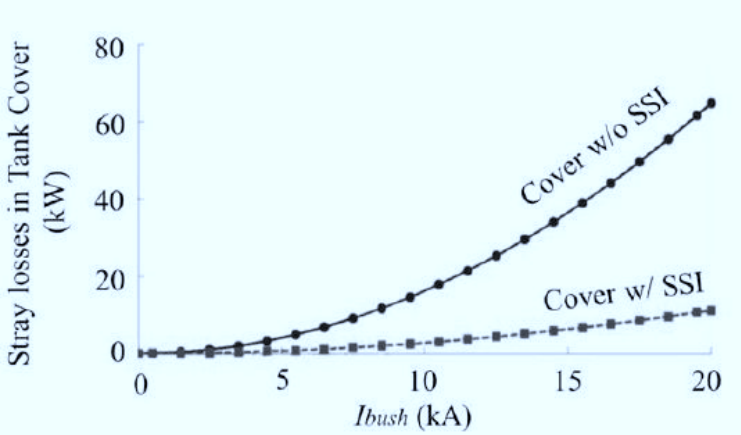
	SST MV	SST LV	SST	LFT
Efficiency [%]	98.3	98.0	96.3	98.7
Volume [m^3]	1.57	1.10	2.67	3.43
Weight [kg]	1270	1330	2600	2590
Mat. cost [kUSD]	34.1	18.6	52.7	11.4

where the self-capacitance is lowest are particularly suitable for high voltage charging applications.

Stray losses in the tank cover of a 75 MVA three-phase core type transformer[5] were analysed. Stray losses in the region surrounding high current bushings were estimated using 3D Finite Element (FE) simulations. In this paper, an L-shape non-magnetic Stainless Steel Insert (SSI) is utilized to reduce the stray losses in the region of the Tertiary Voltage Bushings (TVBs) of the transformer. Stray losses in the tank cover are estimated for a level of overload of 30% considering two cases: 1) When there is no SSI and 2) When the SSI is considered. The reduction of stray losses in the tank cover of power transformers helps to avoid the presence of dangerous high temperature spots in the tank cover of power transformer. Utilization of SSIs in tank covers permits high currents in the bushing regions without overheating problems.

In 2013, the leakage flux was analysed in transformer[6] with and without aluminium shield by Finite Element Method (FEM) to reduce the stray losses. The study describes variation in leakage flux and magnetic flux density with and without shielding and total losses variation with and without aluminum shields on tank walls. The stray losses in transformer tank walls can be considerably reduced by magnetic shields of aluminium.

Another paper presented the magnetic leakage field and eddy current loss[7] in tank, yoke clamps and other electrically conductive construction parts of transformer were computed by three-dimensional (3-D) nonlinear time harmonic finite element method (FEM). Core and tank material magnetizing characteristics were treated as nonlinear by using nonlinear B-H curve. Eddy current losses and the loss density in local place of tank wall can be reduced effectively by adding magnetic shield to the tank wall and help to eliminate hot spots. The eddy current

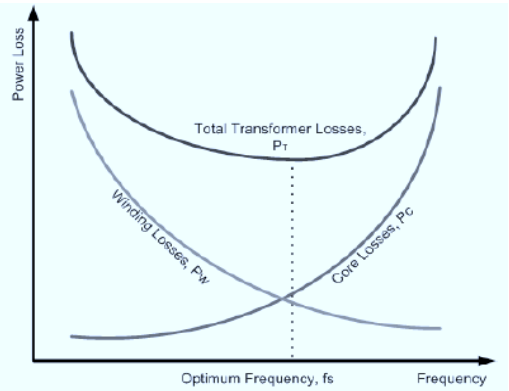


Stray losses with (w/) and without (w/o) SSI in tank cover.

losses of clamps are reduced by 44.15% and 57.25% compared with unshielding for C-type and L-type magnetic shields respectively. The magnetic shields of yoke clamps also have certain influences on the magnetic flux density nearing the winding overhang. C-type magnetic shield has greater influence than L-type magnetic shield.

A paper illustrating the impact of core material choice in the design of a high frequency transformer[8] for an isolated DC/DC converter for energy storage applications. The core material map can be recommended which will guide the designer towards the smallest losses that can be achieved in a given frequency and flux density range. It is up to designer to decide which cores they need use based on what application they looking at and other restrictions like size, cost as well material availability. In addition, the variation of power loss with the loading factor is investigated, which is an important aspect in energy storage system since most systems will operate at reduced loading compared to the peak power capability.

A paper showing the analysis of temperature and pressure on loading oil-immersed distribution transformer at rated load.[9] The tested transformer was sealed type oil-immersed distribution transformer of 400 kVA 3ph 50Hz 400/230V. The results will be useful for developing the design, correction, protection, load specification and temperature estimation of transformer with efficiency, in order to improve better cooling and strengthen transformer tank. The thickness of the tank should be improved or wider corrugated fins be used. The oil temperatures at the middle of the tank were relatively approximate to top oil temperature. The large transformer may be designed in an ONAF (Oil Natural Air Forced) type because of its better oil circulation than ONAN (Oil Natural Air Natural) type.



The principle of finding the optimum operating frequency for the transformer at a given flux density

Summary of Optimum Operating points for Each Core Material Studied

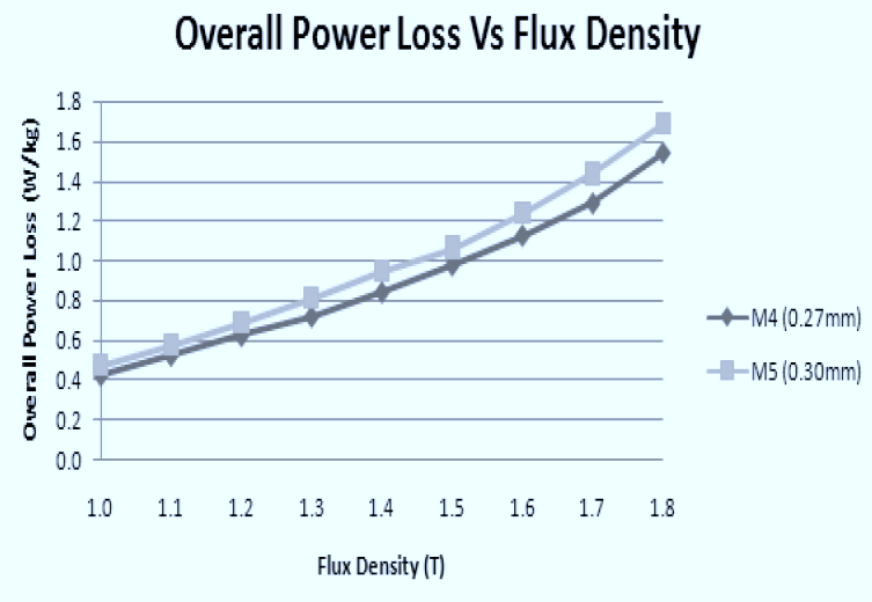
Core material	2605	2705	3C90	3F3	N87	Nanocrystalline
Best system losses [W]	379.5	344	441.3	434.8	417.3	280.9
optimum frequency [kHz]	1.8	3.55	7.55	7.3	7.05	2.8
optimum flux density [T]	1.3	0.73	0.32	0.33	0.35	1.205

A paper proposing a design which will become prominent by obtaining a variant of distributive ratios via an intelligent choice of the secondary–primary–secondary–primary(S-P-S-P) turn ratios in the neighborhood of the auxiliary windings[10] to produce magnetic poles canceling or diminishing the corresponding leakage fields to the maximum effect. The present approach is directed to achieve low hysteresis losses, thereby enabling superconducting winding schemes to achieve their performance at lower cost. The intelligent choice of the distributive ratios in S-P-S-P configuration has substantially improved the hysteresis loss components by 58% and 39% compared with conventional and auxiliary schemes respectively.

A paper discussed the result of an investigation towards the effect of using two different Cold Rolled Grain-Oriented (CRGO) Silicon Iron material[11] to the 100 kVA three phase distribution transformer. This experiment used M4 and M5 material with 5mm different overlap length, configured with yoke and limb arrangement. Power loss has been measured using no-load test with 15 layer of lamination. The power loss of the transformer model core of M4 material at the operation mode flux density, 1.5T is 0.976 W/Kg and that for M5 material was found to be 1.060 W/Kg. This shows that M4 material have lower overall power loss compare to M5 material.

WINDING SCHEMES	TOTAL HYSTERESIS LOSS (W)
Conventional	369
Auxiliary	253
S-P-S-P	154
Hybrid	137

The modifications necessary in transformer design and optimization to handle high-temperature superconductors as the winding material.[12] These changes include AC losses, short-



circuit stresses, and cooling loads. Design results are presented for a five-legged core, three-phase, 3.5 MVA power transformer optimized for reduced weight and footprint space. The changes to the design optimization presented in this paper permit tailoring HTS power transformer for special application at the lowest possible cost.

This paper aimed to analyze leakage inductance based on magneto motive force (MMF) and energy distribution in planar transformer[13] and correct the formula of leakage inductance proposed by previous publications. The investigation of different winding arrangements shows significant advantages of interleaving structure. A novel half turn structure is proposed to optimize leakage inductance and winding loss further. Computed results shows a half turn structure benefit low leakage inductance extremely.

A paper was written presenting the experimental analysis of overheating in the low voltage tank wall of a power transformer, which is near to the low voltage bushings. The power transformer considered in this paper is rated as 44/58/73 MVA, 230/34.5 kV. Hot spots in the tank were discovered during a temperature rise test under overload condition (82 MVA). The hot spots problem was solved using aluminum electromagnetic shields in the tank wall. Temperatures were measured before and after installing the aluminum shields in the tank wall of the power transformer. It was found that aluminum shields considerably reduce stray losses and overheating in the tank wall.

With the development of new insulation materials, vegetable oil was the best substitute for mineral oil. In 2014, some researchers[15] proposed to analyze the performance of transformer (Efficiency and Voltage regulation) by using various insulating fluids, to find suitable oil for improving the efficiency of transformer. The laboratory tests were carried out on sunflower oil to determine the critical parameters, such as breakdown strength, viscosity and the experimental result shows that the sunflower oil has high breakdown strength, high flash and fire point, but the viscosity is also high; good oil should have low viscosity so that it offers less resistance to conventional flow of oil thereby not affecting the cooling of the transformer.

2. Conclusion

A review on transformer design has been presented based on a number of selected references (about 15 assorted works). Relevant publications from journals have been selected, covering a broad range of engineering methods and design considerations. The complexity of transformer design demands reliable and rigorous solution methods. Although studies on transformer design have been carried out on different types of transformers, there are more ways of improving performance of transformers such as following (1) use of new materials for transformers to reduce transformer losses (2) improving the loss angle for bushings (3) use of more improved insulation materials which should increase transformer life as well as strength.

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