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From The Editor's desk

Publication of research papers is a source of spreading knowledge, as it is well known. It disseminates new academic work and lets people know about advancement of science. People get to know how much scientific community has excelled in any particular field of specialization. Published papers act as a rich source of reference material for future researchers. Publication makes the hard work of the researchers meaningful, as, its outcomes are applied and utilized by various stakeholders. Research papers published in the journals give academic visibility and recognition from scientific community.

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The Editor

Prof. Maneesha Shukul

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PREVALENCE, CAUSES AND EFFECTIVE MANAGEMENT OF STRESS AMONG SCHOOL CHILDREN

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ABSTRACT

Stress is the human reaction to events in our environment. Stress is an unavoidable aspect of life. All children feel stress from time to time. The problems related to stress in children and adults are increasing alarmingly in Kerala. So it will be interesting to see how far children's stress is prevalent in recent times.

The study was done in several Indian schools of Thiruvananthapuram and Kochi districts with an objective to identify stress in children to understand the stressors, the contributing factors and also to find out the effectiveness of simple coping techniques and life skills in eliminating, reducing or managing stress. A three-point rating, stress assessment scale was used to assess the stress in children and those with above average stress scores were selected for the study. A total of 1614 children thus selected were grouped age wise into early childhood years (4-6 years); late childhood years (7-10 years) and adolescence (11-17 years) and separate rating scales were given to the three groups of subjects. Several lifestyle factors were studied using separate research tools to understand the stressors in children. Stress coping techniques in the form of booklets were formulated according to the age groups and observed for a period of time in order to see the decrease in their level of stress.

92.3% to 99.1% of the children of 4-17 years of age showed above average stress. The results also pointed out that stress was more at the age of 14 for both girls and boys. Among the various life style factors studied, significant factors which had an impact on the stress level of children or vice versa were analyzed. Later on, stress management strategies were introduced and administered. After comparison with the control group the effectiveness of the stress coping techniques was experimented.

Counseling, intervention programs for children, parents and teachers should be considered as an essential requirement in today's lifestyle. Children particularly pre adolescents should be made aware of their stress and related problems from very early age itself in order to help them manage stress effectively.

Keywords: Stress, Stressors, Stress Management, Coping techniques, Adolescents.

INTRODUCTION

Stress is one of the topics of the century, which has attracted the attention of a wide range of personnel in health, education, religion, sports and also policy makers and the common people. Defining the term stress and choosing a definition of stress can be difficult even for those who are considered experts in the field of stress, stress management and stress relief. The term "stress", as it is currently used was coined by Hans Selye in 1936, who defined it as "the non-specific response of the body to any demand for change" (The American Institute of Stress, 2017).

From a few studies carried out in India and abroad, the health risk behaviors among the children and student population, especially among adolescents (suicidal behavior) was observed to be growing in the recent years.

In Kerala too, behavioral problems, incidents of suicide, physical and psychological problems are all growing up drastically among children and adolescents even though we could make remarkable progress in the field of children's health and educational status . The lifestyle changes have become prominent among children and adolescents irrespective of age and sex. Hence it will be interesting to find out whether these lifestyle changes in any way have added to the stress in children or their behavior.

The study was done in several Indian schools of Thiruvananthapuram and Kochi districts with an objective to identify stress in children, to understand the stressors or the contributing factors and also to find out the effectiveness of simple coping techniques and life skills in eliminating, reducing or managing stress.

This study is an attempt to explore/examine areas like the prevalence of stress in children, the causative factors, preventive strategies and management measures. It is hoped that the present study, gives a deeper insight into the rate and prevalence of stress in children and the relevant socio cultural and other factors leading to stress in children. Such a study can help parents and teachers to understand stress and associated problems in children, ways to reduce the stress in children and to increase their understanding of coping with their children's stress.

By helping children to know about the coping skills, they will be equipped to deal with life's stressful events in a healthy manner that produces wellness in them and in their communities. It is hoped that this study would go a long way to enable parents and teachers to follow better parenting techniques, teaching skills and to steer clear the path of their children towards greater achievement in a stress free manner.

Objectives of the Study

1. To study the prevalence of stress among school children
2. To understand the causative factors of stress among school children
3. To analyze the effectiveness of stress coping techniques and measures in children

MATERIALS AND METHODS

The research design has two parts - Ex-post facto research design and Experimental research. The dependent variables selected for Ex-post facto research were stress and stress level scores. The independent variables included age, sex, and the lifestyle related factors like socio demographic features, environmental and familial factors, school and academic factors, food consumption and dietary pattern, daily activity and time utilization pattern.

Under the Experimental Research, the stress scores and the divisions of stress formed the dependent variables and the stress package developed formed the independent variable.

Conduct of the Study

Schools were selected from Trivandrum and Kochi giving due representation to government and private management, to State and Central syllabi and also for all-boys, all-girls and co-education schools. Once the schools were selected, permission was obtained from the school authorities for selecting the children from their schools for the conduct of the study.

The sample consists of school children between the ages 4-17 selected from the identified schools. First the schools were identified and then two divisions from each class from preschool to 12^{th} standard were randomly selected. A three-point rating, stress assessment scale was given to all the children in the two divisions of each class in the school to identify the required number of children with stress, needed for the study. A total of 1614 children thus selected were grouped age wise into early childhood years (4-6 years); late childhood years (7-10 years) and adolescence (11-17 years) and separate rating scales were given to the three groups of subjects.

From the total children screened, 30 children with highest stress scores were selected from each age group ranging from 4 to 17 years giving equal representation to boys and girls, i.e. a total of 840 children formed the major sample.

Selection of Micro samples

In order to study the impact of stress package in children, three groups of children were selected. The micro sample was selected from the major sample using purposive random sampling method. Further, a sub sample of 112 children having high stress scores and stress related problems was drawn from the major sample, with a minimum of 8 in each age group for in-depth study and education program. A controlled group of 56 children with high stress scores with 4 in each age group including both boys and girls was also selected from the major sample for comparison. Another controlled group of 56 children who obtained normal stress scores were also included for the study to find out the effectiveness of the coping package.

Tools and Techniques used for the study

i) A Stress Assessment scale (S.A. Scale) developed and standardized to screen the children with stress.

ii) A pre-tested questionnaire to study the dietary pattern, Activity time log to determine the time utilization and activity pattern of the subjects, a Stress Inventory for Parental Stress, a standardized Stress Related Attitude Scale to study the attitude of children towards work, school, family atmosphere and their performance perceptions, a standardized schedule and checklist to assess the health problems of the subjects, Rating scale to rate the subjects physical, academic, psycho-social and behavioral adjustment problems related to stress.

iii) A package of need based suitable stress relieving, stress management and stress reducing simple techniques to help the subjects to cope with stress and evaluation schedule to study the effectiveness and impact of coping techniques. Stress counseling, package with motivation classes for subjects, teachers and parents to create awareness regarding stress and stress management.

Statistical Analysis

The statistical analyses that were done on the data included following basic statistics.

Mean, Frequency, Percentages: For the analysis of socio demographic features, food habits, time utilization pattern and stress related problems.

Tests of Significance used were as follows.

Analysis of Variance: To compare the stress among school children based on age and sex, to study the influence of socio demographic factors and food habits of children on their stress.

Correlation: To understand the relationship between stress of the children and factors like their BMI, food use frequency, maternal stress, attitude and behavior of the children in the family, and stress related problems.

t - Test: To compare the difference in the time spent on various activities by children on a working day and holiday, and to understand the activity pattern of children. Paired t test was done to find out the difference in stress level before and after stress management and counseling classes and also to find out the efficiency of coping package.

High statistical methods:

Multiple regression analysis was used to find out the most contributing factors of stress among school children.

RESULTS AND DISCUSSION

The major objectives of this study were to identify stress in children, to assess stressors or the contributing factors due to their cultural variation, lifestyle and sex differences and also to find out the effectiveness of simple coping techniques and life skills in eliminating, reducing or managing stress. Keeping in view the objectives of the study the data collected from the macro and micro sample was statistically analyzed, and the results are presented below under the following headings.

1. Prevalence and extent of stress in children
2. Stress causing factors
3. Impact of coping skills and stress management on stress of children

Prevalence and Extent of Stress in Children

A three-point rating, stress assessment scale was used to assess the stress in children. The children thus selected were grouped age wise into early childhood years (4-6years); late childhood years (7-10years) and adolescence (11-17years) and separate rating scales were given to the three groups of subjects. The stress levels of children are depicted in figure 1.

The results pointed out that the majority of the children were facing above normal level of stress. That is 94% to 99% of the children of 4-17 years of age showed above average stress that can lead to different types of problems in them in their future life. It was clear from the results that,

majority of the children faced stress, at the preschool age, early adolescence and late adolescence period.

Preschool stress is very common among children nowadays. Working parents especially mothers have no other options than leaving their children to play school at a very early age. It is seen that nowadays children enter play school at the age of 2 and half years. Separation from parents, adjustment problems with the new school environment, teachers, other children and change in their lifestyle after entering school, all these could lead to feeling of insecurity which in turn causes stress in them. It was pointed out earlier that preschool stress is the response of a preschool child to physical, mental, emotional, and spiritual demands made upon the child (Anna Hart, 2007).

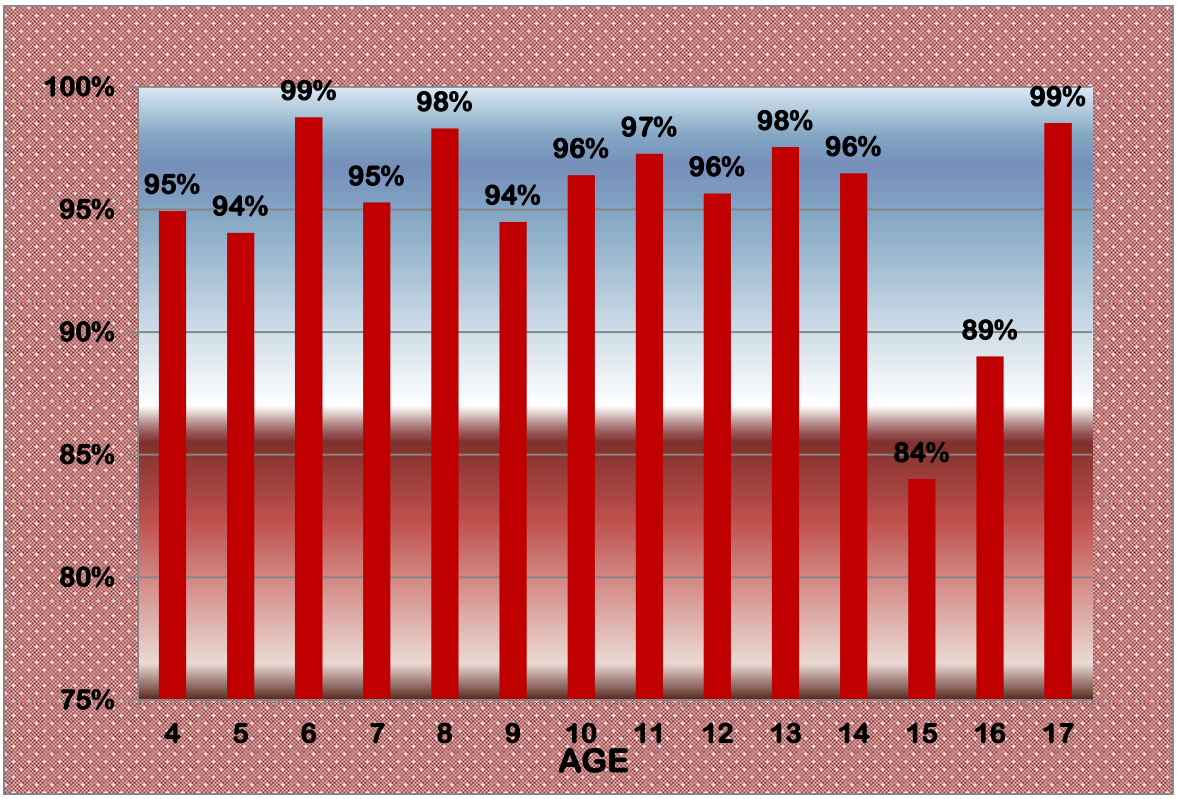

Fig 1: Age wise distribution of the children based on the stress scores

The busy lifestyle and pressure about studies and extracurricular activities imposed on them by parents and teachers plus the stress during growing years could be the reason for the growing stress in children. Relevant studies done on school children also revealed similar results.

A 12 year study done on Health fears for teen girls by Templeton (2003), between 1987 and 1999, revealed that levels of psychological distress increased from 19% to 33% in girls, compared to an increase from 13% to 15% in boys. In this study, worries about schoolwork, relationships, weight and looks also seemed to increase notably. It was reported that, "the increase in the levels of psychological distress among young females over a period may be explained by an

increase in educational expectations, which together with more traditional concerns about personal identity appears to have elevated levels of stress, with adverse consequences for mental health.

The stress of children was next compared based on age, and sex to find out significance on stress of children and the results are presented in table 1.

Age wise comparison revealed significant difference with the stress of children at 1% level (210.48**). Thus, it can be said that age also had a significant influence on the stress of children. The results also showed that majority of the children faced stress during adolescence (93.7). The sex wise comparison did not have any significant influence on the stress of children. Another thing noted on sex wise comparison was that girls were found to have more stress (77.45) than boys (76.37).

Table 1: Comparison of stress in children based on Age and Sex

Variables Studied		n	Mean Score	F	p
Age	4	158	61.83	**210.48****	0.000
	5	84	61.31		
	6	81	63.68		
	7	106	61.42		
	8	118	61.89		
	9	109	61.58		
	10	111	66.86		
	11	110	89.91		
	12	138	88.07		
	13	122	92.17		
	14	142	90.78		
	15	100	87.53		
	16	100	86.23		
	17	135	93.7		
Sex	Girl	898	77.45	1.52	0.220
	Boy	716	76.37		

In a study done on 'Suicidal behaviour amongst adolescent students in south Delhi'(Sharma et al., 2008) it was seen that about 15.8% reported having thought of attempting suicide, while 5.1% had actually committed suicide, both being more in females than in males. The findings of the study highlighted that the prevalence of suicidal behaviour was found to be quite high and is a matter that should evoke public health concern.

As age showed influence with the stress of children, it would be better to know in which age children faced more stress and so comparisons were made between boys and girls for each age group and is depicted in table 2.

Table 2: Age wise comparison of stress in girls and boys

Age	Girls	Boys	F	p
	Mean			
4	61.80	61.86	0.003	0.957
5	61.67	60.90	0.250	0.618
6	64.16	63.37	0.297	0.587
7	60.84	62.25	1.068	0.304
8	62.48	61.17	1.377	0.243
9	61.57	61.59	0.000	0.990
10	66.75	67.00	0.008	0.931
11	89.63	90.21	0.087	0.769
12	89.30	86.66	2.011	0.158
13	91.88	92.50	0.087	0.769
14	93.91	86.50	**14.653****	0.000
15	85.27	90.41	2.451	0.121
16	85.38	87.19	0.459	0.500
17	94.89	91.39	2.896	0.091

p value <.01 = Significant at 1% level (**)

p value <.05= Significant at 5% level (*)

From table-2, it was clear that, for both girls and boys, pre-adolescent and late adolescent stages were more stressful. It can be pointed out that at the age of 14, significant difference (14.653**) could be seen between the stress of girls and boys. Thus it can be assumed that 14 years

of age was a period of transitions wherein the children faced many problems in relation to puberty, academics, social pressure, peer pressure etc, which lead to severe stress and tension in them.

Another study done at Thiruvananthapuram suggested that a total of 97 (10.1%) adolescents had severe stress. Majority of adolescents have cited mothers' and fathers' parenting role as their major stressor (56.5% and 53.5% respectively). Mothers reported that excessive watching of television is a major cause of lack of interest in studies and that is the main reason for stress at home. 37.7% of the teachers felt that school gives a lot of academic stress to the child. (Aswathy. et.al, 2015)

The Center for Advancement of Health, (1999) reported that girls and boys experienced about the same levels of stress, which tended to increase with age. Other studies reported that girls may be particularly prone to depression during adolescence. They may experience higher levels of the types of stress associated with depression and may be more reactive to these types of stress than boys.

Among the 397 students who participated in the study, 348 (87.6%) were positive for stress. Stress was observed in 139 (89.7%) female students and 209 (86.4%) male students; Association between education of parents and stress was not observed. Academics, parents, teachers and friends were major stressors. School-going adolescents are exposed to stress. Females are particularly at higher risk. The academic pressure is one of the major precursors for the stress. Introduction of stress management techniques in school curriculum can be helpful. (Watode BK et al, 2015)

Stress Causing Factors

A comprehensive analysis of socio demographic and familial features, the dietary pattern, the time utilization and activity pattern of the children, maternal stress, attitude and behavior in the family and stress related problems of the children was carried out to study their profile, to understand their life style and also to know the influence of these factors on their stress. For a detailed and clear perception, in the present study, attempts were made to compare each stress related factor and stress of the children. Thus, the factors influencing the stress of children can be revealed.

Of the different variables studied, 26 showed significant influence on children’s stress. The factors contributing significantly to stress in children irrespective of variations in age and sex of the children are presented in table 3.

Table 3: Results of Multiple Regression Analysis of Selected Variables and Stress of Children

Variables	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
Stress Score (Constant)	38.300	7.456		**5.137****	0.000
Caste	1.407	0.584	0.036	**2.409***	0.016
Mother's Education	0.002	0.189	0.000	0.008	0.993
Type of delivery	1.063	0.761	0.020	1.396	0.163
Birth Term	-0.029	1.069	0.000	-0.027	0.979
Rooms	0.090	0.359	0.004	0.249	0.803
BMI	0.279	0.145	0.059	1.925	0.055
Nibbling	-0.387	0.594	-0.011	-0.652	0.514
Variables	Unstandardized Coefficients		Standardized Coefficients	**t**	Sig
	B	Std. Error	Beta		
Habit of Skipping Meals	1.569	0.517	0.045	**3.33****	0.002
Use of Beverages	-0.370	0.195	-0.030	-1.894	0.059
Sedentary Activities(W.Day)	0.299	0.213	0.024	1.405	0.160
Moderate Activities(W.Day)	0.350	0.115	0.060	**3.039****	0.002
Heavy Activities(W.Day)	0.030	0.085	0.005	0.347	0.729
Sleep(W.Day)	0.027	0.263	0.002	0.101	0.920
Sedentary Activities(H.day)	0.468	0.262	0.051	1.787	0.074
Moderate Activities(H.day)	0.478	0.266	0.068	1.795	0.073
Heavy Activities(H.day)	0.219	0.243	0.025	0.898	0.369
Sleep(H.day)	-0.004	0.307	0.000	-0.014	0.989

Maternal Stress	0.022	0.014	0.024	1.602	0.110
Attitude and Behaviour	0.052	0.034	0.023	1.499	0.134
Physical Problems	0.021	0.046	0.032	0.466	0.641
Puberty Problems	0.573	0.313	0.038	1.830	0.068
Emotional Problems	0.159	0.051	0.211	**3.142****	0.002
Social Problems	0.010	0.048	0.013	0.207	0.836
Psychosocial Problems	0.154	0.050	0.205	**3.068****	0.002
Academic Problems	0.134	0.047	0.180	**2.855****	0.004
Gender Relations	0.137	0.044	0.237	**3.143****	0.002

These results also confirmed that with so many extracurricular activities and competitions forced upon the children during holidays they are likely to face too much of stress. On top of this they are loaded with homework and academic projects from the school. So children have neither time nor are allowed to play on holidays. When these children remain indoors and start playing with computer or watch TV, there again they are being nagged or scolded by the elders. So many of children preferred working days to holidays.

In a study done on "Psychological distress among college students in Kerala' (Jaisoorya.et.al, 2017) it was observed that the prevalence of psychological distress was 34.8% with a female predominance. Students with psychological distress were more likely to report academic failures, substance use, suicidality, sexual abuse and symptoms of attention deficit hyperactivity disorder. Students with severe distress had higher morbidity.

Effectiveness of Coping Skills and Stress Management with Stress of Children

A stress coping package with techniques in the form of booklets was developed, standardized and given to children with stress. Pre and post tests were done to find out the impact of the package.

The children of experimental group included children with moderate to severe stress and the initial and final scores were monitored and rated. Another two groups considered as control group (1) and control group (2) were also selected for the study. The children of control group (1) had stress level similar to the children of experimental group. These children were not given the stress coping package and their initial score and final score after three months were noted. The last group was the control group 2 selected using the same criteria but the stress level was normal. Similar to the experimental group these children were also given stress coping package and the efficiency of the package was analyzed among the three groups.

The results showing the initial and final stress scores in the stress level of the children belonging to the three groups before and after the experiment was collected through a pre-test and

post-test. This was given to the children before and after administering the package for the specified period to rate their stress. The stress score of the three groups of children before starting the experiment is presented in table 4.

Table 4: Comparison of the Stress Scores of Experimental group and Control group

	Mean Score	t-value	p
Experimental Group vs. Control Group (1)			
Experimental Group	160.87	-0.248	0.402
Control Group (1)	161.45		
Experimental Group vs. Control Group (2)			
Experimental Group	160.87	**11.600****	0.000
Control Group (2)	140.36		

p value <.01 = Significant at 1% level (**)

p value <.05= Significant at 5% level(*)

From the table, it was clear that there was no significant difference between the initial scores of experimental group and control group (1) because the children of both groups had similar level of stress. The stress level of children ranged from very severe to moderate level. But, in the case of control group (2) significant difference at 1% level was noted between the stress levels of children of the two groups. This was because the stress level of the children who belonged to the control group (2) had normal level of stress unlike those of experimental group who had severe stress.

In order to check the efficiency of the coping package in reducing the stress, the initial and final scores of the three groups were collected and statistically analyzed. The results were compared using t- test and are shown in the table below.

The table revealed that among the children of experimental group who had stress initially, the stress had reduced considerably after three months. The results showed significant difference at 1% level proving that the coping package administered to them was very efficient in reducing stress and following these they could keep their stress to a minimum.

Table 5: Impact of the Stress Coping Package on Experimental group and Control Group

Mean	Experimental Group	**Control Group (1) Children with Similar Stress (Without Stress Package)**	**Control Group (2) Children with Normal Stress (With Stress Package)**
Initial Score	160.87	161.45	123.93
Final Score	110.84	161.25	106.71
t-value	**33.120****	0.070	**4.614****
p	0.000	0.472	0.000

p value <.01 = Significant at 1% level (**)

p value <.05= Significant at 5% level(*)

On observing the results of the children of control group (1) with stress, where coping package was not administered, and not much difference in the stress level was noted. Their stress levels remained more or less the same throughout the period. While the children of the other group i.e. control group (2) which had normal level of stress and was given the coping package showed significant difference in their stress level at 1% level. After three months period, the children's stress though it was normal with no problems, was found to reduce and gave the children more self-confidence to take up ventures and to think and view positively which again proved the efficiency of the coping package.

This was made possible by the constant support of the parents and teachers. Both fathers and mothers were equally motivated and they helped children in doing the stress management techniques. This was not practiced before because of the insufficient encouragement and lack of awareness of the parents regarding what was going on in their children's lives.

CONCLUSION

The intervention for a short period was found to be effective after the awareness classes were given for parents and teachers. Long-term studies have shown that interventional programs in children are far more successful and cost effective than in adults. So if proper guidance and awareness is developed in children from very early years and both parents and teachers take care to lead a stress free life and later steps to provide a stress free environment to children, many of the problems related to stress can be prevented or controlled. Also alongwith this, one should be able to develop a healthy lifestyle in children. Thus we can certainly forecast a future generation with physical and mental health and leading thereby a healthy lifestyle by the joint effort of parents and teachers.

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GENDER DIFFERENTIALS IN HEALTH SEEKING BEHAVIOURS: AN OBSERVATIONAL STUDY OF HOSPITALS IN DELHI

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ABSTRACT

Health care seeking behaviour is termed as those activities that are taken into account in response to any kind of symptoms experienced by an individual i.e. visiting the health facility, taking proper treatment etc. The present research aimed at gaining insight into pro-activeness of parental health care seeking behaviour towards their children in 0-6 years age group. The research was conducted in two hospitals of South-West district of Delhi. One government and one private hospital was purposively selected with In-patient facilities as the administrations of the hospitals allowed to conduct the research in their premises without sharing any personal information of the patients admitted in the hospital at the time of the study. The data examined the medical records of the children from In-patient departments of both the hospitals and reviewed them for a period of two months that is June-July, 2016. Through the observation of hospital health records the research studied and analysed the health problems and their severity with which children were admitted to hospitals for treatment, and the importance of timely admission in the hospitals through a gender lens. The study findings indicated that the male children are still the priority in most of the families. The female children are more vulnerable to suffer from severe diseases and lack of proper health seeking behaviour. This study also finds that female children face differentials in various ways ranging from not paying attention to the diseases at an early stage, taking them late to the health facility and request for the early discharge. The study points out that there is a large scope to create awareness among the people about seeking health services at the earliest for their children to improve health outcomes.

Keywords: Gender differentials, health seeking behaviour, health records, improving health outcomes.

INTRODUCTION

Child Survival: A Priority Concern for Development

Child survival today has become one of the biggest challenges in developed as well developing countries as it has direct impact on the economy of any country. If access to health care facilities is denied, chances are that the child/infant's health may suffer and make him prone to disorders and diseases. The inability to have access to complete immunization and nutrition, especially during the window of opportunity for the first 1000 days of life may affect physical or cognitive development of a child and also its ability to learn and earn.

India with its 1,311.1 million populations has been ranked at 131st position in terms of the human development indices among 188 countries (Human Development Report, 2016). The HDI value of 0.624 puts it in medium human development category. Since 1990, the HDI value of India

has increased by 45 % i.e. from 0.428 to 0.624. In 2015, about 80% of deaths occurred in Sub-Saharan countries and South Asian countries in which half of the deaths occurred in Congo, Ethiopia, India, Nigeria and Pakistan (UNICEF, 2016). If we take a look at India's Infant Mortality Rate (IMR), then it is poorer as compared to Arab North African countries. The states like Madhya Pradesh have worst IMR i.e. 56, followed by Assam with 55, Uttar Pradesh and Orissa with 53, Rajasthan with 49 and Gujarat with 38 IMR. This data indicates towards the poor health of a mother who is giving birth to the child. The new born is unable to survive more than 1 year due to some deficiencies. If we talk about our national capital then it has worst Infant Mortality rate among the four metropolitan cities between 2010 and 2012 with 30 newborns dying for every 1,000 live births (The Hindu, Feb 26, 2014).

Even the third Sustainable Development Goal (SDG) articulates to ensure healthy lives and promote well-being for all at all ages with its three targets which are as follows:

a) Reducing the global maternal mortality rate to less than 70 per 1000 live births.
b) Reducing neonatal mortality to atleast 12 per thousand live births.
c) End the epidemics of AIDS, Tuberculosis, Malaria, neglected tropical diseases and combat with Hepatitis, water-borne diseases and other communicable diseases

The above targets can be achieved only if the government ensures priority to the most vulnerable and disadvantaged children. The latest data National Family Health Survey-4 (NFHS 4) shows a positive decline in the Infant Mortality rates since its predecessor survey.

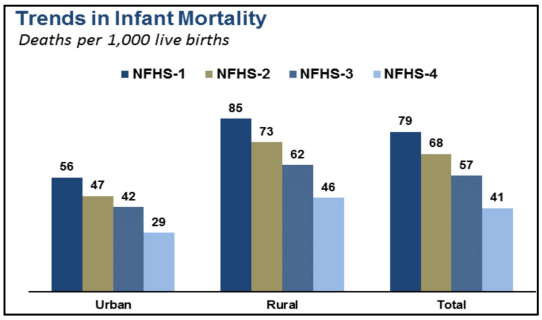

Fig 1: Infant Mortality trends across three cycles of NFHS

Source*: National Family Health Survey. NFHS-4 (2015-16), Ministry of Health and Family Welfare*

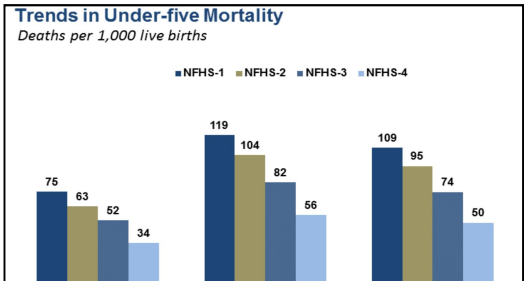

Fig 2: Under Five Mortality trends across three cycles of NFHS

Source*: National Family Health Survey. NFHS-4 (2015-16), Ministry of Health and Family Welfare*

As can be seen in the Fgure-1 and Figure 2, while comparing the early childhood mortality rates, the data of NFHS-1, NFHS-2 and NFHS-3 and NFHS-4 over four five years period indicate that there is a decrease in infant mortality rate, but if we compare the infant and under five mortality rate in rural and urban population then there is lesser decline in the infant mortality rate due to less access to health care facilities and practice of traditional birth processes. Also the lack of awareness can be a possible reason of higher mortality rate in rural areas.

Health of female child and Gender based differentials in India

Health seeking behaviour is defined as all those activities undertaken by an individual in response to symptoms experience (Dominic, Y.N., & Nayak, 2013). The health seeking behaviour in families may vary according to their socio-economic, cultural and demographic factors. In a patriarchal country like India, women sadly still remain the weaker sex and suffer differentially in terms of her health and well-being relative to her male counterpart. The strong son preference in the families, with the belief that son will take care of his parents later in life, and scarcity of resources may contribute to mistreatment of the daughters which leads to her poor health. More resources in terms of money, time and health care facilities may be spent over sons (Kamalapur& Reddy, 2013). No doubt the female mortality rate is higher as compared to male mortality. Women face discrimination right from their childhood as more attention is paid to the male child in terms of treatment and nutrition especially when resources are scarce. Parents' educational level of low income level and the geographical location also impact the health of the children. The differentials in lifestyle and financial status have a great impact in health seeking behaviour of families. The children who belong to lower income families suffer disproportionately from almost every disease (National Institute for Health Care Management Research and Educational Foundation, 2007).

Rationale of the study

The purpose of this study was to understand the parental health care seeking behaviour towards their children in 0-6 years of age group. Also the study aimed to document the health problems faced by children in this age group and the influence of socio-economic, cultural and demographic factors on the health care seeking practices of the parents. The research was carried out in two hospitals (one government and one private) of the South-West districts of Delhi as it is largely rural in nature with lesser health facilities. The information of two months record of admitted children was looked into and analysed.

METHODOLOGY

Locale of the study

South-West district of Delhi was selected as the locale for the study as it is largely rural in nature with comparatively lesser health facilities. According to the Government of NCT of Delhi, the South West district is divided into three subdivisions: Kapashera, Najafgarh and Dwarka. Two hospitals in the Najafgarh subdivision with the In-patient facilities were selected for the study with one being a government hospital and other private. The permissions were taken from both the hospitals to conduct the proposed study in the hospital premises. Thus, the locale for the study comprised of:

1. One Private hospital in South-West District in Delhi (Najafgarh)- Orthoplus Hospital. Orthoplus hospital is situated in the rural belt of the South-West district of Delhi. It has facility of 50 beds in their In-patient department. It is surrounded by approximately 50 villages and caters 24x7 to the people.
2. One Government hospital in South-West District in Delhi (Najafgarh)- Rao Tula Ram Memorial Hospital (RTRM). The RTRM hospital was established by Public Work Department in 1989. This is a 100 bedded hospital. Its objective is to provide free health care service to the people and is recognised as a good institution in providing service. As the hospital situated in rural area, it faces a lot of operational difficulties due to scarcity of water and lack of man power. Despite that people prefer this hospital as it is the only government hospital in that area.

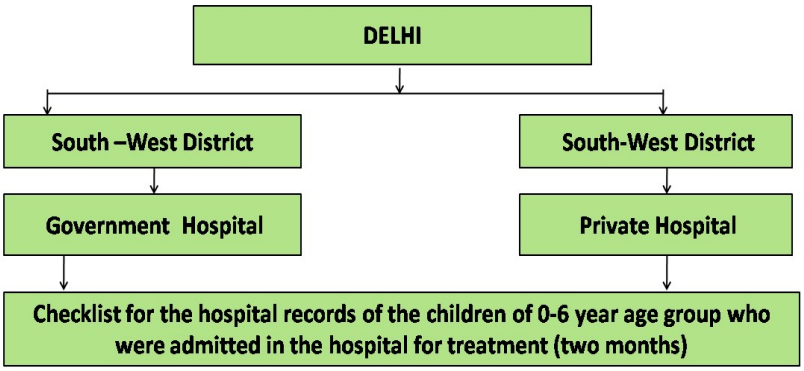

Fig.3: Sample Plan for Hospital Record

Sampling

The medical records of the children from in-patient department of both of the hospitals were reviewed for period of two month that is June and July, 2016 to understand the illness pattern of the children in two months and also the records of the new born children; the number of deaths that had taken place in these two months were also asked for. Purposive sampling was used for soliciting information from the hospitals.

Tools for Data Collection

Observation and Checklist was used to review the data of hospital records of two months i.e. June and July, 2016 was reviewed. The different aspects examined were:

- Numbers of male and female children admitted in the hospital in 0-6 years of age during these two months
- Numbers of birth of male and female children during this period
- Number of deaths of male and female children during this period
- Type of the illness with which children were brought to hospital and the severity of the diseases

Observation was done while studying hospital records and seeing patients with the families; for instance, how many family members were in the hospital other than the mother while the child was admitted in the hospital and the contribution of the other family members in this situation.

FINDINGS & DISCUSSION

In order to understand the parental health care seeking behaviour towards their children in 0-6 years age group, the research attempted to examine and document the medical records of the two hospitals (one private and other government) for two months period to know the trends of the health care practices of the parents for their children.The study aimed to examine and document the health problems and their severity with which children are admitted to the hospitals for treatment. For these two months records of both of the hospitals under study were reviewed for the following information:

- Numbers of male and female children admitted in the hospital in 0-6 years of age during these two months
- Numbers of birth of male and female children during this period
- Number of deaths of male and female children during this period
- Type of the illness with which children were brought to hospital and the severity of the illness

The information regarding the medical history of the children admitted into the hospital during the two months period was aimed to examine and document the health problems with which children were admitted to the hospitals. Also it aimed at studying the health care seeking practices of the parents for their child in 0-6 yeas age group. Following are the findings based upon the data reviewed.

Table 1: Number of Children admitted in the hospitals (June- July, 2016)

	H1[Govt.]				H2[Pvt.]			
Age of Children (in years)	Male		Female		Male		Female	
	F	%	F	%	F	%	F	%
0 – 2	69	68.32	67	79.76	19	42.22	22	46.81
2 – 4	15	14.85	7	08.33	16	35.56	14	29.78
4 – 6	17	16.83	10	11.91	10	22.22	11	23.41
	101	100	84	100	45	100	47	100

Table 1 shows us the data of the age of the children who were admitted in the hospital in two months. The data indicates, the highest percentage of the children admitted were in the youngest age group of 0-2 years both in government and private hospital. This also indicates that the incidence of sickness is highest in the first two years. Also, it can be seen that the number of the

female children admitted in the hospital in first two year of age was less than male children but in 4-6 years age group the number of female children was higher than that of male children. It could be related to stronger genetic makeup of girls to survive, after birth. They are able to take minor illness. But as they grow up their naturally endowed immunity diminishes. During early childhood neglect in nutrition and health seeking for daughters especially among economically poor families may lead to severe sickness needing medical care and attention.

Table 2: Number of births during June-July, 2016

Number of Births	H1 [Govt.]		H2 [Pvt.]	
	F	%	F	%
Male	58	54.59	7	33.33
Female	56	45.41	14	66.67
	114	100	21	100

This table 2 shows the number of births that took place in both of the hospitals in the month of June and July, 2016. In private hospital, 21 deliveries took place in which 66.67% were female children. It is seen that the number of births in private hospital was less than the number of births in government hospital. This may probably be due to higher costs involved in private hospitals and lesser numbers of beds in private hospital.

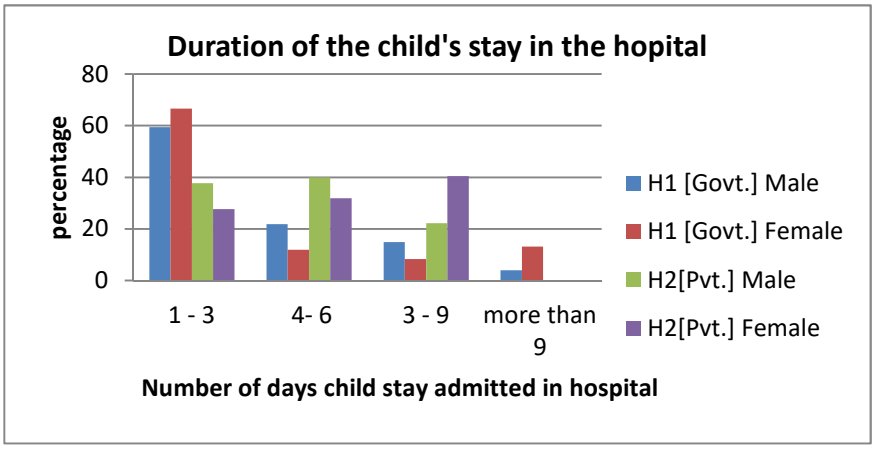

Fig 4: Duration of Child's stay in the hospital

Figure 4 shows the data regarding how long the children stayed in the hospital after admission. In private hospital 37% of males were admitted for 1-3 days and 40% of the females were admitted for 3-9 days. This may indicate the severity of the health problem the girl child was suffering from. On the other hand 59.41 % males and 66.67 females were admitted for 1-3 days in Government hospital. Also, it can be seen that 13.09% of the females were admitted for more than 9 days, whereas only 3.96% males were admitted for such a long duration. It again indicates that

may be the female child was suffering from chronic or acute diseases or may be in severe condition, which could be due to delay in bringing them to the hospital during the earlier stages of illness. According to a study by Chandwani and Pandor, 2015, it was found that more than 50 % of sick male newborns received medical treatment whereas only 23.3% of the sick female newborns received medical treatment. Also it was found that the female under three years of age received less medical care than the boys of same age group (Chandwani and Pandor, 2015). These findings indicate that female children are neglected during the early stage of any diseases and brought to hospitals when it becomes a threat to their lives.

Table 3: Problem with which child was admitted to hospital

Illness	H1 [Govt.]				H2[Pvt.]			
	Male		Female		Male		Female	
	f	%	f	%	F	%	F	%
Common	44	43.56	32	38.09	15	33.33	8	17.02
Infectious	27	26.73	14	16.67	11	24.44	15	31.92
Acute	20	19.8	19	22.62	12	26.67	14	29.79
Chronic	10	09.91	19	22.62	7	15.56	10	21.27
	101	100	84	100	45	100	47	100
	N=185				N= 92			

Table 3 shows the data of the problems with which the children were admitted to the hospital. More than 30 percent of the male children were admitted due to common illnesses like viral fever, cold and fever, vomiting etc. whereas nearly 20 percent of the females were admitted due such common illness. This indicates that the common illnesses in the male children are paid more attention than in female children. The severity of the diseases was taken more seriously in case of the male child. If we see the chronic illness data of both of the hospitals it can be seen that more than 20 % of the females were admitted due to chronic illness in private hospital and 22.62 % were admitted in government hospital which is much higher as compared to males. On the whole the percentage of male children in both the hospitals with common and infectious diseases was higher whereas for female children it was acute and chronic diseases.

Table 4: Behaviour of the parents during the admission of the child in the hospital

Response	H1 [Govt.]				H2[Pvt.]			
	Male		Female		Male		Female	
	F	%	f	%	F	%	F	%
Admitted as per doctor's advice	84	83.17	64	76.19	40	88.89	34	72.34
Asked for early discharge	10	09.9	15	17.86	2	04.44	8	17.02
Referred to another hospital	7	06.93	5	05.95	3	06.67	5	10.64
	101	100	84	100	45	100	47	100
	N=185				N= 92			

According to WHO, (World Health Statistics, 2016) it can be observed that the major causes of child mortality were prematurity, birth related complication and neonatal sepsis while pneumonia, diarrhoea, injuries and malaria are the major causes of deaths in neonatal period.

The table 4 shows us the data regarding the behaviour of the parents during the admission of the child and also the disease severity of the child. In private hospital 88.89 % of the male children were admitted as per the doctor's advice as the parents didn't want to take any risk and that is the reason that child remained in the hospital until his health improved. If we see the data of the same hospital, in case of female children nearly 20 percent of the female children's parents asked for early discharge. This may indicate that the health of the female children was comparatively paid lesser value by the parents and also the families who were suffering from financial crisis may have wanted to save money. Also 10% of the female children were referred to another hospital due to severe condition whereas only 3% of the male children were referred to another hospital, reinforcing the fact that female children are brought to the hospitals much later in their sickness.

In government hospital patients were entitled to free treatment yet the parents of the female children did not want to admit their child in the hospital due to fear of disturbing rhythm of the homes.

CONCLUSION

The in-patient departments are the key features of both the hospitals in Najafgarh area of South West district of Delhi.The goverment hospitals have larger infrastruscture as compared to private hospital but there were advanced facilities in the private hospital. Also government hospital had higher number of beds as compared to private hospital. Therefore higher number of population visited in the government hospital as per the analysis of two months record of both the hospitals. Yet another reason for the higher number of children in government hospital was that all the children were entitled to free treatment as per then hospital guidelines. In government and private hospital records a total of 185 and 92 children respectively were reviewed.

The highest percentage of the children admitted was in the youngest age group of 0-2 years both in government and private hospitals. Thus, this study concluded that children in 0-2 years of age are more likely to fall sick. Also, it was observed that the number of the female children admitted in the hospital in the first two years was less than male children but in 4-6 year age group the number of female children was higher than that of male children. It could be related to stronger genetic makeup of girls to survive, after being born. They are able to bear minor illness. During early childhood neglect in nutrition and health seeking for daughters especially among economically poor families may lead to severe sickness needing medical care and attention. The study inferred that a male child was paid adequate attention in early years of childhood and a higher percentage of the male children were admitted due to common or infectious diseases whereas a higher number female children were admitted for chronic diseases, which indicates that the female child admitted in the hospital was paid less/limited attention and faced severe disease condition. Thus the severity of the disease consequently led to a longer stay of the female child in the hospitals as compared to male child.

Further, the behaviour of the parents was analysed on the basis of that how many parents made their child stay in hospital as per the doctor's advice or asked for early discharge or shifted the children in other hospital with or without doctor's permission. In private hospital 88.89 % of the male children were admitted as per the doctor's advice as the parents didn't want to take any risk and that is the reason that child remained in the hospital until his health improved. If we see the data of the same hospital, in case of female children nearly 20 percent of the female children's parents asked for early discharge. This may indicate that the health of the female children was comparatively paid lesser value by the parents and also the families were suffering from financial crisis may have wanted to save money. Also the 10% of the female children were referred to another hospital due to severe health condition whereas only 3% of the male children were referred to another hospital, reinforcing the fact that female children are brought to the hospitals much later in their sickness.

Having found that gender discrimination does exist with respect to health seeking behaviour of parents for children aged 0-6 years through this research, the study recommends that parents must be sensitized towards the health of the female child too. They must be made aware about the impact of poor health of a female child in her initial years on her future life. The social seclusion and practicing differentials in health seeking behaviour will have adverse effect in the long term on the physical and mental health of the girl. Further, the families should be informed about the family insurance and various kinds of health schemes to reduce their economic burden. In the present times when government hospitals are occupied and private health care is so expensive, regular savings for health through health insurance has to be promoted for all the family members.

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TRENDS IN THE CONSUMPTION PATTERN OF CARBONATED BEVERAGES AND SWEETENERS AMONG ADOLESCENTS IN KERALA – A COMPARATIVE STUDY

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ABSTRACT

The study entitled "Trends in the consumption pattern of carbonated beverages and sweeteners among adolescents - a comparative study" was done between two extreme districts situated at the tips of Kerala, namely Thiruvananthapuram and Kannur. A total of one hundred and eighty students were included for the study; ninety from Thiruvananthapuram and ninety from Kannur district. Survey method was used to collect the data from the samples, using stratified random sampling method. A well structured questionnaire was used to determine the age, income, lifestyle, family composition, food habits, number of times of meal eating pattern, occasion, factors influencing the consumption pattern of carbonated beverages, sweeteners and type of meal followed, details about the carbonated beverages and sweeteners. Questions regarding the source of knowledge, the source of purchase, reason for buying ,buying habit ,frequency of consumption pattern of carbonated beverages and sweeteners were also included under this section. A twenty four hour recall method was used to identify the present dietary habit of the sample. The result obtained for the study was quite alarmimg. Trends in consumption of carbonated beverages and sweeteners among adolescents are found to be high in general. While comparing the trend between two districts, it was observed that, adolescents residing in the rural parts of Kannur consume more carbonated beverages and sweeteners, than their counterparts in urban Kannur and Thiruvananthapuram. This may be due to the fact that the adolescents in Kannur are more free and enjoy better freedom in going and eating out than those in Thiruvananthapuram. Even the culture among adolescents both the areas is different.

Keywords: Adolescence, Carbonated beverages, Sweeteners, Consumption pattern

INTRODUCTION

The prevalence of cardio vascular diseases is highest in Kerala in the country. Lifestyle and dietary modifications contribute to the high prevalence of cardiovascular diseases in Kerala. Diseases like hypertension, diabetes, obesity are on the rise in Kerala, which has a direct impact on the cardio vascular diseases of the state. Eating habits play a significant role in the life-style management of the people. Adolescence is a period of time in which children are prone to a higher prevalence of risk taking behaviours such as overeating and under eating. Overeating and under eating can be a displacement for other problems such as a low self - esteem, interpersonal problems, and an acute sense of shame and doubt. It is the most rapid period of growth, wherein a boy gains 19g/day and a girl gains 16g /day of body weight (Agarwal, 2010&Moreno, L, Fleta, R etal 2010).

Data from cross sectional studies have identified several dietary patterns associated with early obesity development, such as meal frequency and distribution, skipping meals, soft drink and fast food consumption, as well as high eating speed (Moreno, 2010). The importance of developing healthy eating habits during childhood and adolescence is obvious. Rapid physical growth creates an increased demand for energy and nutrients (Spear, 2002&Stang J,S 2005).
It is interesting to understand trends in the consumption pattern of carbonated beverages and sweeteners among adolescents in Kerala. The present study is thus planned as a comparison between two extreme districts situated at the tips of Kerala- Thiruvananthapuram and Kannur.

Objectives

1. To assess the socio economic status of the selected samples.

2. To compare the trends in consumption pattern of carbonated beverages and sweeteners among adolescents in Thiruvananthapuram and Kannur.

3. To find out the factors influencing the consumption pattern of carbonated beverages and sweeteners among the selected sample.

DESIGN OF THE STUDY

Sample:

The two districts at the extreme tips of the State of Kerala-Thiruvananthapuram at the South and Kannur at the North were selected for the study. Both the districts have their own peculiarities and features. Thiruvananthapuram, is the capital city of the state. The study was conducted among 180 children between the age group of 13-15 years of age; 90 from Thiruvananthapuram and 90 from Kannur district. They were further divided based on the type of school, and gender using Stratified Random Sampling Method. The selected age group is also known as “middle adolescence”.

Tool:

A well-structured questionnaire was prepared to examine the Trends in the consumption pattern of carbonated drinks and sweeteners among adolescents in Kerala to have a comparative study. It consisted of questions related to age, income, lifestyle, family composition, food habits, number of times of meal, eating pattern, occasion, factors influencing the consumption pattern of carbonated beverages, frequency of taking sweeteners and type of meal followed, the consumption pattern and more details about the carbonated beverages and sweeteners, questions regarding the source of knowledge ,the source of purchase, reason for buying ,buying habit ,frequency of consumption pattern of carbonated beverages and sweeteners were also included under this section.

A twenty four hour recall method was used to identify the present dietary habits of the sample and also to find out the intake of carbonated beverages and sweets.

A pilot study was carried out among 20 adolescents and the tools prepared were modified in the light of the findings from the pilot study.

Collection of data:

Both primary and secondary data were collected for the present study .Primary data was collected through Survey using questionnaire and appropriate tools and secondary data was collected from reviewing the literature from book, journals, references, official reports and websites.

Analysis of the data:

The collected data was statistically analysed using statistical methods and was presented with appropriate graphs and diagrams.

RESULTS AND DISCUSSION

Socio-Economic Background of Adolescents:-

The socio-economic background of the respondents includes age, gender, place of residence, type of family, family monthly income, occupation of mother, occupation of father. The age wise categorization shows that fifty nine percent of the respondents belongs to13-14 age group and forty one percent belongs to 15-16 age group. Equal consideration was given to both the genders and the place of residence. Family though the smallest social unit has a unique position in the society. About seventy two percent of the respondents belong to nuclear family and twenty eight percent belong to the joint family system. Income determines the standard of living of a family or person, to some extent. These Variables were also incorporated in the study. It was found that thirty one percent of the respondents belong to a family having a monthly income of below Rs.5000; thirty one percent have an income between Rs 5000-10,000;about eight percent belong to the income category of above Rs 50,000.

Food Habit and Food Consumption Pattern:-

The table no:1 reveals that out of 180 samples selected for the study, eighty nine percent were non vegetarians and only ten percent were vegetarians. While analyzing their frequency of food consumed in a day, it was understood that fifty two percent of respondents consume food three times per day and thirty five percent consume food four times per day and nine percent consume a frequent meal pattern of five times per day. Specific time schedules for taking food were also analyzed. It was found that sixty five percent have no specific time schedule for taking food whereas only thirty four percent have specific time schedule for consuming food.

The data regarding the frequency of eating out and the number of snacks consumed in a day was collected from the respondents. It was found that ten percent of the respondents have the habit of consuming food from outside daily, whereas eighteen percent consumes outside food weekly; and six percent consumes fortnightly ; eighteen percent eat out once in a month; and forty six percent never eat food from outside. While comparing the data of the respondents with respect to their area, it was found that fifty three percentage of the respondents have the habit of eating out in Kannur; whereas fifty percent of the respondents have the habit of eating out in Thiruvananthapuram.

Table 1: Food habit and consumption pattern

Sr. no	Food Habits	N (n=180)	Percentages (100)
1	Dietary habit		
	Vegetarians	19	10
	Non vegetarians	161	89
2	Frequency of consuming food		
	Two times	5	2
	Three times	95	52
	Four times	63	35
	Five times	17	9
3	Specific time schedule for taking food		
	Yes	62	34
	No	118	65

Number of snacks consumed by respondents was also identified and it was reported that fifty three percent consume only two snacks per day. Twenty percent consume three snacks per day. Eighteen percent consumes more than three snacks per day whereas nine percent of the respondents never consume any type of snacks. While comparing the data of the respondents with respect to their area, it was found that forty seven percent of the respondents consumed snacks per day in Kannur; whereas thirty six percent of the respondents consumed snacks every day in Thiruvananthapuram.

Table – 2 shows that fifty one percent of the respondents never had the habit of skipping breakfast. Forty nine percent of the samples had the habit of skipping breakfast, nineteen percent were skipping breakfast always, fifty percent skipped breakfast sometimes, twenty five percent were skipping breakfast rarely, six percent were skipping breakfast once in a while. While comparing the data of the respondents with respect to their area, it was found that sixty six percent of the respondents skipped breakfast in Kannur; whereas fifty eight percent of the respondents skipped breakfast in Thiruvananthapuram.

It was found that fifty seven percent had the habit of nibbling between meals. Forty three percent did not have the habit of nibbling between meals. While comparing the data of the respondents with respect to their area, it was found that one hundred and two of the respondents had the habit of nibbling between meals; whereas ninety nine percent had the habit of nibbling between meals in Thiruvananthapuram. Out of one hundred and eighty adolescents, seventy two percent had the habit of taking packed lunch to school. Only twenty eight percent did not have the habit of taking packed lunch to school. Eight percent of respondents ate puffs as lunch. Nine percent ate chicken/veg roll as their lunch. Four percent of respondents ate pizza as lunch. Two percent respondents ate noodles and juice as lunch. Three percent respondents consumed soft drinks with lunch.

Table 2: Habit of skipping meals

Sr. No	Habit of Skipping break fast	Kannur		Thiruvananthapuram		Total count	percentage
		Boys	Girls	Boys	Girls		
1	Yes	28	16	26	18	88	49
	No	17	29	19	27	92	51
2	Frequency of skipping						
	Always	5	3	9	2	19	19
	Sometimes	16	11	15	8	50	50
	Rarely	8	5	7	5	25	25
	Once in a while	3	2	1	0	6	6
3	Habit of nibbling between meals						
	Yes	28	29	21	25	102	57
	No	18	17	20	23	78	43

Permission from parents for having lunch from outside was also analyzed. Forty three percent of the parents permit their wards to eat out. Fifty seven percent of the parents never allow them to eat out.

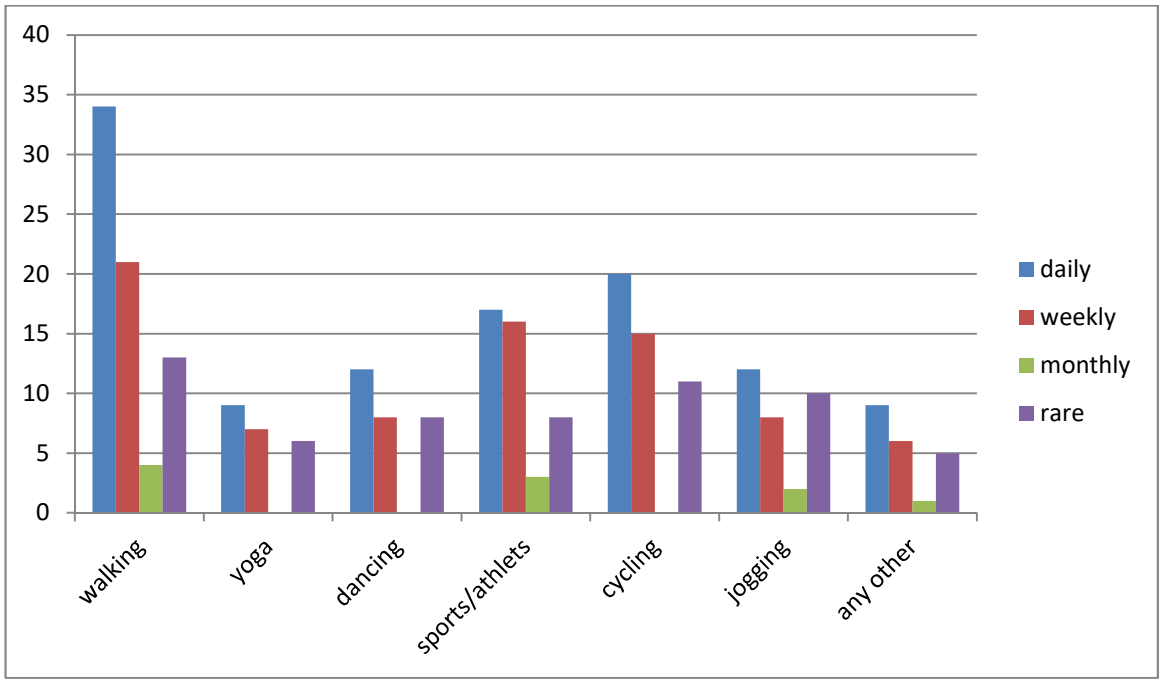

Fig:1 Activity pattern of the respondents

Walking, Yoga, dancing, sports/athletics, cycling, jogging and other activities like karate, swimming etc, are some of the types of exercises, that the respondents usually engage with. It was reported that walking, is the most common form of physical activity followed by cycling (twenty six percent), sports/athletics (twenty four percent), jogging (eighteen percent), yoga and other activities like karate, swimming etc are twelve percent.

Consumption Pattern of Carbonated Drinks and sweeteners:-

Majority of the respondents (twenty eight percent)have the habit of consuming carbonated beverages and sweeteners in Thiruvananthapuram. Twenty two percent do not have the habit of consuming carbonated beverages and sweeteners. Thirty two percent have the habit of consuming carbonated beverages and sweeteners from Kannur. Seventeen percent have no habit of consuming carbonated beverages and sweeteners .While comparing the habit of consumption with the area of study, it was evident that sixty one percent of the respondents have the habit of consuming carbonated beverages and sweeteners in Kannur, whereas thirty nine percent of the respondents have the habit of consuming carbonated beverages and sweeteners in Thiruvananthapuram.

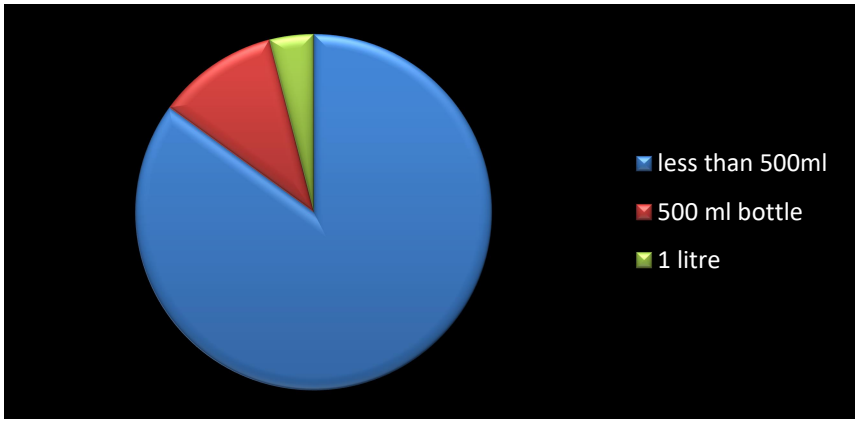

Fig:2 Average consumption pattern per day

It was found that eighty five percent of the respondents' average consumption of carbonated beverages was less than 500ml per day, eleven percent respondents consumed half litre per day, four percentage consumed 1 litter per day.

Statistical Analysis:

Analysis of consumption pattern of carbonated beverages and sweeteners based on selected variables:

Chi-square analysis was done to find out the association between consumption pattern of carbonated beverages and sweeteners with respect to selected variables like age, gender, place of residence, types of family, monthly income of the family.

While analyzing the chi-square test it was observed that there is no significant difference in the consumption pattern of carbonated beverages with respect to age group, gender, type of family and

monthly income of the family of the adolescents, whereas there is a significant difference in the consumption pattern of carbonated beverages and sweeteners based on the place of residence. Based on the results, it was found that adolescents residing in the rural areas of Kannur consume more carbonated beverages and sweeteners than their counterparts in urban Kannur and Thiruvananthapuram.

Regarding the factor influencing the respondents purchase of carbonated beverages and sweeteners, taste is the key factor, second preference given to advertisement, the third preference given to flavor, fourth preference is given to price, quality, fifth preference is given to variety of brand and variety of items, sixth preference is given to influence of friends, seventh preference is given to packing and appearance, eighth preference is given to bacteriologically safe, next they give preference to habit and nutrient content, the last preference or least importance is given to acceptance of carbonated beverages and sweeteners due to change in the life style.

CONCLUSION

From the study, it can be concluded that the trends in consumption of carbonated beverages and sweeteners among adolescents is found to be high in general. While comparing the trend between two districts, it was observed that adolescents residing in the rural parts of Kannur consume more carbonated beverages and sweeteners, than their counterparts in urban Kannur and Thiruvananthapuram. This may be due to the fact that the adolescents in Kannur are more free and enjoy better freedom in going and eating out than those in Thiruvananthapuram. Even the culture among both the areas observed among adolescents is different. Being the capital city and the place where there is more number of working class population, obviously the children are set to frame career goals at a very early stage of life. Frequency of going for tuitions and academic pressure were reported to be high among those in Thiruvananthapuram. Whereas these type of stigma is comparatively low in Kannur, and they are free to move out with peers. The availability and accessibility of these foods is also high among the adolescents in Kannur .

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A STUDY ON ENERGY BALANCE IN ADOLESCENT SWIMMING TRAINEES OF SPORTS AUTHORITY OF INDIA – THRISSUR CENTRE, KERALA

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ABSTRACT

Nutrition forms the foundation of one's fitness, physical performance, and overall well-being and is essential for optimizing athletic performance. Maintaining energy balance along with adequate nutrient intake optimizes sports performance and overall health. The purpose of this study was to find out the Energy Intake (EI) and Energy Expenditure (EE) of adolescent swimming trainees of Sports Authority of India - Thrissur, Kerala. Twelve players aged 13-16 years, engaged in swimming sport were selected for this study. The tools used were questionnaire coupled with an interview schedule method. EI was derived from three day-24 hour recall method. The EE was assessed from seven day activity and was calculated from the physical activity factor, weight and age. Mean, Standard Deviation (SD), Paired t- test and t-test were used to analyze the data**.** The mean age, height and weight of the players were 14.91±0.90 years, 1.64±0.08 cm, and 50.3±7.41 Kg respectively. Their mean EI was 2580±214.98 Kcal and their EE was 2620±129.36 Kcal. This indicates that the EI was adequate to satisfy the increase in EE and was meeting the daily energy needs of the players.

Key words: Swimming – Performance - Energy Intake – Energy Expenditure

INTRODUCTION

Nutrition forms the foundation of one's fitness, physical performance, and overall well-being. Swimming is a sport of various intensities and durations. Swimming events can range from 50 and 100 meters (Sprints), 200 and 400 meters (middle distances), and 800 and 1500 meters (distance). Long-distance swimming includes the swim portion of the full triathlon (2.4 miles) and ultra-endurance events (24 miles). All swimmers have demanding training, so adequate daily energy and nutrient intake is important (Dunford, 2006).

Proper nutrition is an important component in the total training program of the athlete. The consumption of energy – containing nutrients such as carbohydrate provides the fuel necessary for increased biological work. Nutrient deficiencies can seriously impair performance, whereas nutrient supplementation may delay fatigue and improve performance (Kang, 2018). The diet with very low energy intake is often seen with a reduction of muscle mass on the body, which directly affects strength, endurance and performance (Barclay, 2012).

The importance of good nutrition as a major factor in performance should not be overlooked. And for athletes to maintain improvement within a regimen of hard training and adequate rest is a prime necessity. Any athlete, trying to keep pace in modern urban society, tends to neglect the importance of rest at night and between twice-daily workouts. Quality rest allows for

regeneration of the body and adaptation to stress. In fact, rest can be regarded as unseen training (Colwin, 2002). Getting right nutrition is a key for athletic success. The right meal and snack choices every day will significantly improve the performance in training and competition. They can train harder for longer; recover quicker between swim practices and, most importantly, race faster at swim meets (Knox, 2018).

It is important that adolescent athletes consume appropriate food and drinks to ensure that they have enough energy for training and competitions as well as daily growth and development ((Barclay, 2012). Like athletes, swimmers will find that paying proper attention to nutrition will enhance their health, their fitness, and their performance in swimming (Ryan, 2015).

Proper nutrition is essential for optimizing athletic performance (Fick, 2011). In addition, maintaining energy balance along with adequate nutrient intake optimizes sports performance and overall health (Giovannini, 2000). Energy balance is integral for adolescents to sustain optimal growth and development (Graczymk, 2009), with additional nutritional intake required to offset the increased energy cost of high-level training and competition (Graczymk, 2010). Energy intake is usually higher in athletes versus non-athletes because of their higher energy expenditures. Food records, 24 hour dietary recalls and dietary history interviews are used to determine an athlete's energy intake (Hausswirth, 2013). Adequate energy intake is the first nutrition priority for athletes. Meeting energy needs is critical for athletic performance and for maintaining or increasing lean body mass (ILSL, NIN, SAI, 2007)

Thus, the purpose of the study was to determine the energy balance in swimming trainees and compare it with the Energy Intake (EI) and Energy Expenditure (EE) of these players.

METHODOLOGY

Selection of subjects

Twelve (n=12) adolescent swimming players aged 13 - 16 years were selected from The Sports Authority of India (SAI) – Thrissur centre, Kerala.

Development of interview schedule

With the help of experts, the researcher finalized the interview schedule and the required data was collected.

Anthropometric Measurements: Anthropometric measurements namely height and weight were collected using standard methods. Based on the measurements, Body Mass Index (BMI) (Wt/ht^2) was calculated. Height was measured to the nearest 0.1 cm using a standard stadiometer and body weight was measured with minimal clothing to the nearest 0.1 kg using a calibrated electronic weighing scale.

Energy Balance: Energy balance was determined by subtracting 7-day mean Energy Expenditure (EE) with 3-day mean Energy Intake (EI). Dietary survey (24 hour recall method) was carried out to obtain the information regarding the dietary pattern and food habits. The nutrient intake was calculated by using Nutritive Software 'Count what you eat' by National Institute for Nutrition for dietary assessment and planning.

To determine the caloric requirement, a Basal Metabolic Rate (BMR) was calculated using Harris Benedict equation. The formula considered for the factors of height, weight, age, and gender; as well as a physical activity level of 1.9 was used i.e. 1.9 × BMR. The Total Energy Expenditure (TEE), Estimated Energy Expenditure (EEE) and the time of activity depending on the physical activity intensity and frequency were individually measured. Furthermore, at the time of this data collection, all players were apparently healthy.

Statistical Analysis

The data was analyzed using Mean, Standard Deviations (SD), Standard Error (SE), One–sample t-test and Paired t-test. The mean nutrient intake of different foods was compared with the Recommended Dietary Allowance (RDA) using the one sample t-test. In addition to this, percentage of carbohydrate, protein and fat was compared with the normal range for sportsperson using the one sample t-test. Data was analyzed using the Statistical Package of Social Sciences (SPSS) version 19.

RESULTS AND DISCUSSIONS

Table 1 shows mean anthropometric parameters of the swimming players. The subjects ranged in age from 13 - 16 years.

Table 1: Mean Anthropometric parameters of the Swimming players

Variables	Mean±SD
Age	14.91±0.90
Height	1.64±0.08
Weight	50.3±7.41
Body Mass Index (BMI)	18.54±2.54
Basal Metabolic Rate (BMR)	1479.94±120.80

Mean age was 14.91±0.90 years, mean height was 1.64±0.08 cm, and mean weight was 50.3±7.41 Kg, Body Mass Index (BMI) computed was 18.54±2.54 (Wt/ht^2) and Basal Metabolic Rate (BMR) of the swimming players was 1479.94±120.80 Kcal/day.

Table 2 shows the individual mean intake of macronutrients per day and percentage contribution of macronutrients per day and gram per Kg body weight by these macronutrients.

Table 2: Individual macronutrients level (percentage, gram per day and gram per body weight) for swimming players

Participant	EI (Kcal/day)	E.E (Kcal/day)	Energy Balance
1	2483	2813	**-330**
2	2318	2711	**-394**
3	2468	2577	**-110**
4	2286	2592	**-306**
5	2429	2569	**-140**
6	2480	2700	**-221**
7	2478	2676	**-198**
8	2658	2654	**4**
9	2779	2762	**16**
10	2830	2594	**235**
11	2880	2394	**485**
12	2880	2394	**485**

From the table, it can be seen that mean daily intake of carbohydrate, protein was less than their RDAs whereas fat intake was found to be above the RDA level. Average daily intake of Carbohydrate was 672 gm/day (13.61 gm/Kg BW, 56.47 %), Protein was 37.5 gm/day (0.76 gm/Kg BW, 12.90 %) and Fat was 76.5 gm/day (1.57 gm/Kg BW, 30.61%).

Table 3: Individual differences in Energy Intake and Energy Expenditure of the swimming players

Participant	CHO (%)	CHO (g/day)	CHO (g/kg/bw)	PRO (%)	PRO (g/day)	PRO (g/kg/bw)	FAT (%)	FAT (g/day)	FAT (g/kg/bw)
1	9.22	05	14.4	11.77	4	0.7	29.02	72.54	1.5
2	4.96	54	12.6	12.66	7	0.7	32.37	80.94	1.6
3	7.10	80	13.6	12.45	6	0.7	30.45	76.12	1.5
4	5.32	58	12.7	13.14	8	0.7	31.54	78.86	1.5
5	7.33	82	17.1	13.01	8	1.0	29.65	74.14	1.9
6	9.08	03	12.6	12.59	7	0.7	28.33	70.82	1.3
7	1.15	09	17.4	13.84	0	1.1	35.01	87.53	2.5
8	5.03	55	12.8	12.97	8	0.7	32.00	80	1.6
9	7.90	89	13.0	12.39	6	0.7	29.71	74.27	1.4
10	4.61	50	12.8	13.18	8	0.8	32.20	80.51	1.6
11	8.00	90	10.6	13.44	9	0.6	28.56	71.4	1.1
12	8.00	90	13.8	13.44	9	0.8	28.56	71.4	1.4

Table 3 shows the individual differences in the Energy Intake (EI) and Energy Expenditure (EE) of the swimming players and the energy balance (positive and negative).

Average Energy Intake (EI) and Energy Expenditure (EE) for all swimming players were 2580 Kcal/day and 2620 Kcal/day respectively. Mean EE was significantly higher than mean EI. Out of the twelve swimming players, seven of them had negative energy balance and all the other swimming players were found to be positive energy balance. This resulted in a mean daily energy deficit of 38±85.49 Kcal/day.

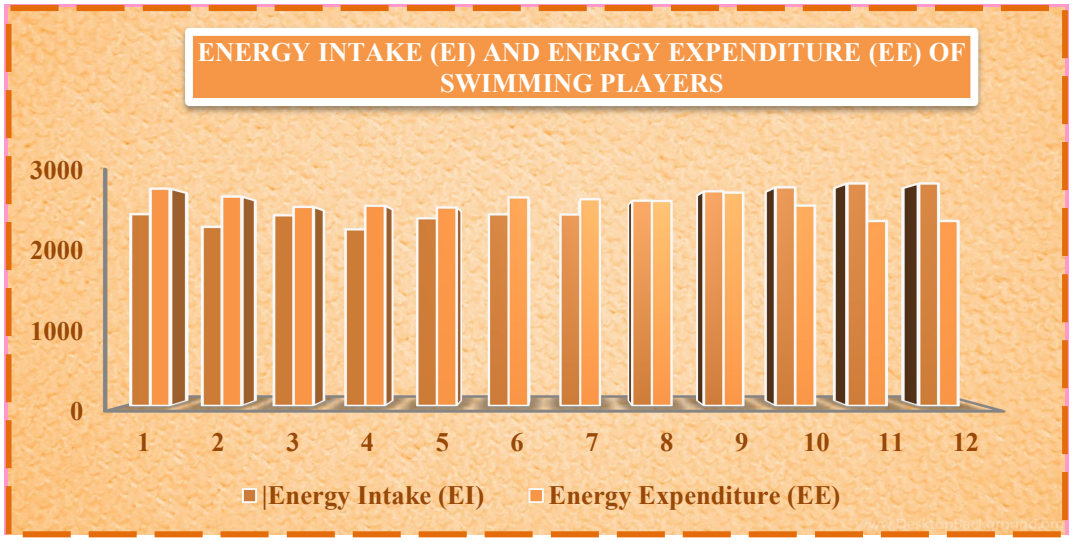

Fig 1: shows the Energy Intake (EI) and Energy Expenditure (EE) of swimming players

Table 4: Comparison of Energy Intake and the Energy Expenditure of the swimming players

Paired Sample		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Energy Intake (EI)	2580	12	214.98	62.06
	Energy Expenditure (EE)	2619	12	129.49	37.38

Table 4(a): Comparison of Energy Intake and the Energy Expenditure of the swimming players

Group	N	Mean Difference (Diff)	Test (paired T-Test)	P
Energy Intake (EI) and Energy Expenditure (EE)	12	-38.91	0.4502	0.6613

For this, paired sample t-test was used. Comparing the Energy Intake (EI) and Energy Expenditure (EE) among swimming players had a mean difference of -38.91, since the t-value is 0.4502 and p = 0.6613; whereas p<0.05, thus; the difference is not statistically significant.

Table shows the mean daily energy intake and other macronutrients of the swimming players.

Table 5: Mean daily energy intake and other macronutrients of the swimming players

Macronutrient	Swimming Player (n = 12)	Normal Value	t-value	p-value
Energy (Kcal)	2580±214.98	3500	14.811	0.000
Carbohydrates (gm)	364±36.69	599	22.188	0.000
Protein (gm)	83±8.60	145.8	25.289	0.000
Fat (gm)	87.33±7.58	125.7	17.52	0.000

****RDA for Sportspersons ***Calculated for specific sport - ILSL**

When mean daily energy intake and other macronutrient distributions were analyzed, Independent sample t-test was used; energy intake (t=14.811, p=0.000) as well as all the macronutrients were found to be below the acceptable range and were statistically significant. Mean daily carbohydrate intake was found to be below their Recommended Dietary Allowance (RDA) (t=22.188, p=0.000) and was extremely statistically significant, mean protein intake (t=25.289, p=0.000); was statistically significant and mean daily fat intake (t=17.52, p=0.000); was statistically significant.

Table 6 shows the Percentage contribution of Total Carbohydrate, Protein and Fat of swimming players.

Table 6: Percentage contribution of Total Carbohydrate, Protein and Fat of swimming players

Macronutrients	P%±SD	Normal Range	t-value	p-value
Carbohydrate	56.47 ± 2.32	60 – 65 %	9.704	0.000
Protein	12.90 ± 0.56	10 – 15 %	0.572	0.578
Fat	30.61± 2.03	25 – 30 %	6.148	0.000

Table 6 shows the percentage values of energy derived from carbohydrate, protein & fat for swimming players. Percentage energy derived from carbohydrate was found between 60–65 % (56.47 ± 2.32) (t=9.704, p=0.000) and was found to be less than the normal range and was extremely statistically significant; percentage energy derived from protein was found to range between 10-15 % (12.90 ± 0.56) (t=0.572, p=0.578) and was found to be in a normal range and was statistically not significant and percentage energy derived from fat was found to range between 25-30 % (30.61± 2.03) (t=6.148, p=0.000) and was statistically significant.

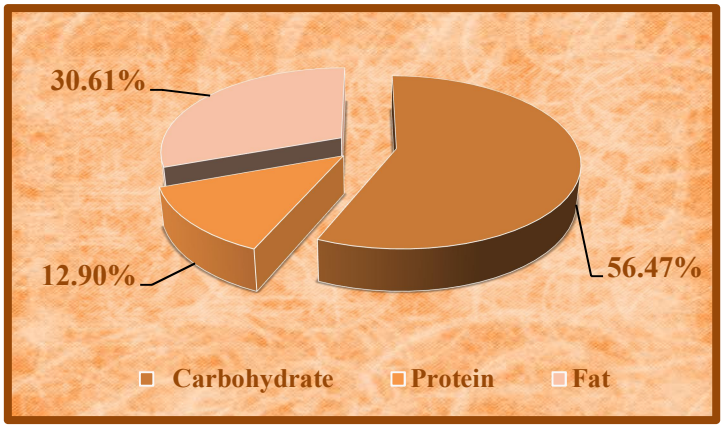

Fig 2: Percentage contribution of energy from carbohydrate, protein and fat of swimming players

Achieving energy balance is crucial for the athlete's ability to consistently train at the intense levels needed for athletic success and continued well-being (Maughan, 2014). The difference between energy intake and expenditure, frequently referred to as energy balance, has become of great interest, because of its direct relationship. The roles of energy intake and expenditure are extremely important in sportspersons and knowing this can help them in maintaining a daily balance; creating a positive level or negative balance and make the difference between gaining weight and losing weight. Adequate attainment of energy balance becomes an important goal for athletes, because maintaining energy balance with appropriate nutrient intake optimizes exercise performance and the training practice.

Thus, the study focused on the energy expenditure and energy intake of adolescent swimming players training at Sports Authority of India (SAI) - Thrissur Centre, Kerala. The aim of the study was to simultaneously quantify Energy intake (EI) which was recorded for three consecutive days-24 hour recall method and Energy Expenditure (EE) which was determined for seven days. The assessment of Energy Expenditure (EE) was calculated using Harris–Benedict's equation from the swimming players over a 7-day period. In relation to the specific player studied herein, data suggests that these swimming players' daily energy expenditure was ranging from 2394 to 2813 Kcal/day.

CONCLUSIONS

The findings demonstrated that over a seven day period, players were in negative energy balance and also it was understood that the values were somewhat equal to the energy expenditure and can be interpreted that the energy intake can be sufficient to meet the demands of training and competition. Mean daily Energy Intake (EI) was significantly lower than mean daily Energy Expenditure (EE). Proper nutrition during training is one of the keys to success in competition. Because energy expenditure increases during a training period, the caloric intake needed to maintain body weight may increase considerably an additional 500 - 1,000 Calories or more per day in certain activities. Additionally, the type of training and performance can also change, highlighting those heavy training days and match days which can be a particular threat for energy

balance. By selecting additional calories wisely from a wide variety of foods, players can obtain an adequate amount of all nutrients essential for the formation of new body tissues and proper functioning of the energy systems that work harder during exercise. A balanced intake of carbohydrate, fat, protein, vitamins, minerals, and water is all that is necessary. For endurance athletes, dietary carbohydrates should receive even greater emphasis. Such information is likely to be of use to practitioners and players who should consider adjusting energy intake accordingly.

The mean daily EI and EE data reported here suggest that these swimming players are capable of matching overall energy requirements. The mean daily Energy Expenditure (EE) was 2619±129.49 Kcals and Energy Intake (EI) was 2580±214.98 Kcals. Thus, the EI was found to be lower than EE. There was no significant difference between Energy Expenditure (EE) and Energy Intake (EI).

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NUTRITIONAL STATUS OF CHILDREN AGED 1-5 YEARS ATTENDING RURAL *ANGANWADI* IN SITARGANJ BLOCK, UTTARAKHAND

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ABSTRACT

Malnutrition among children below five has been a major public health problem with a devastating effect in the present as well as adverse consequence in the future. The present study aimed at analyzing the nutritional status of children below 5 attending *anganwadi* in a rural area of Uttarakhand state. Anthropometric indices like weight for age, height for age, weight for height, mid arm circumference for age and BMI for age were collected and compared with WHO 2006 Growth Standards using z-scores. It was found that 3.96% children were underweight, 25.74% stunted and 4.9% wasted. BMI for age also showed percentage of children suffering from thinness and overweight. Thus in order to meet the goals set by SDGs to end hunger and all form of malnutrition by 2030, more effective intervention and large scale surveys are required, keeping inconsideration the multifaceted etiological factors of malnutrition.

Keywords: malnutrition, anthropometric indices, *anganwadi*, Uttarakhand

INTRODUCTION

Malnutrition among children under five is a major public health problem in a developing country like India. The severity of malnutrition is observed more in rural areas and among girl child compared to those living in urban area and male child, respectively (Yadav et.al., 2016). Uttarakhand state, carved out of Uttar Pradesh state 17 years ago, is no exception. According to NFHS-4 report, in Uttarakhand state, 34% children under five are still stunted, 20% are wasted and 27% are underweight, although the brighter side to the problem of malnutrition is that the percentage of stunting and underweight has reduced compared to NFHS-3 data (Ministry of Health and Family Welfare, 2018). The data collected by ICDS wing of Women and Child Welfare department of Uttarakhand, state that 18000 children in the age group of 0-6 years are malnourished with highest proportion of malnourished children in Udham Singh Nagar district, Uttarakhand (TOI, 2018). Therefore the current research is undertaken.

Objective

To study the nutritional status of rural children availing facilities of ICDS in Sitarganj block of Udham Singh Nagar district of Uttarakhand.

METHODOLOGY

A cross sectional study was conducted in the rural area of Udham Singh Nagar District. Children attending all the three *anganwadis* in the village *Jhari* of Sitarganj block, Udham Singh Nagar district, Uttarakhand were selected. Anthropometric measurement viz. height, weight and mid upper arm circumference (muac) was measured using appropriate technique and age was recorded. BMI (kg/m^2) was calculated. The five indices of nutritional status - weight for age (W/A), height for age (H/A), weight for height (W/H), muac for age (M/A) and BMI for age (BMI/A) were compared with WHO 2006 Growth Standards using z-scores. The children falling below -2SD cut off for W/A were considered as underweight,< -2SD cutoff for H/A as stunted, <-2SD cutoff for W/H as wasted, <-2SD cutoff for M/A as suffering from acute malnutrition,<-2SD cutoff for BMI/A as measure of thinness and above 2SD cutoff indicated overweight.

RESULTS AND DISCUSSION

A total of 101 children in the age of 1-5 years were attending *anganwadi*, out of which58 were female and 43 were male. Highest percentages of females were in the age group of 3-4 years and highest percentages of males were in the age group of 4-5 years. Age-wise and gender–wise distribution of children is shown in Table 1. The figures in parenthesis show percentage.

Table 1: Age and gender-wise distribution of children attending *anganwadi*

Age group (years)	Boy(%)	Girl (%)	Total
1-2	02(4.65)	17(29.3)	**19(18.8)**
2-3	12(27.9)	07(12.06)	**19(18.8)**
3-4	11(25.58)	20(34.48)	**31(30.7)**
4-5	18(41.86)	14(24.13)	**32(31.7)**
Total	**43**	**58**	**101(100)**

The anthropometric indices indicating nutritional status of children are shown as follows and data is presented in table 2 & 3.

Weight for age distribution

A total of 3.96% children were underweight, who were all girl child. Analyzing the data across gender and age it was seen that 6.89% girls had lower weight as per their age and none of the male child had lower weight for their age. The girls showing underweight were in the age range of 1-2, 2-3 and 3-4 years.

Height for age distribution

A high percentage (25.7%) of children were found to have low height for their age. Higher percent of girls (32.75%) were found to be stunted as compared to boys (16.27%). The stunting in girls was seen in all the age groups whereas in boys it was observed only in 2-3 year age group.

Weight for height distribution

Weight for height distribution which is an indicator of wasting was found to be 4.95 %. The wasting was higher in female children (5.17%) as compared to male children (4.65%). Wasting in boys was seen in 3-4 years of age, on the other hand among girl child wasting was present in 3-4 and 4-5 age group.

Recent studies conducted among children attending *Anganwadi* in Maharashtra, showed prevalence of malnutrition as 26.8 % (W/H) and 15.6 % children as underweight (Gondikar, 2017).In children attending *anganwadi* in Puducherry, the prevalence of underweight, stunting and wasting was found to be 28%, 28% and 38.5% respectively(Suganya et al., 2017). A study conducted among children attending *anganwadi* in Doiwala block of Uttarakhand, revealed that 47% children were stunted, 25% were underweight and 31.5% had low muac. More girls were stunted and wasted compared to boys (Kaur et al., 2014). In comparison to the above reported recent studies, the percentage of malnutrition was low in the current study which found 3.96% children as underweight, 25.74% as stunted and 4.9% as wasted, although across gender the results are in line with study by Kaur et.al. (2014).

Mid arm circumference for age

14 children had muac<-2sd for their age, of which 12 were males and two were females. 27.9% boys and 3.44% girls had less muac as compared to WHO standards. Age wise classification showed that low muac for age was found in age group of 2-3, 3-4 and 4-5 among boys whereas among girls the low muac was found in age group 3-4 years.

Mid arm circumference is an indicator of mortality risk with malnutrition and indicates presence of acute malnutrition among children. Both muac and W/H scores less than -3SD signify severe acute malnutrition, but in the community settings usually muac is considered as a better indicator of diagnosing and referring malnourished children. Tadesse et al. (2017) reported discrepancy in the scores of muacand W/H in identifying children with severe wasting but they also found that muac and W/H score are in fair agreement in defining boys and children below 24 months as wasted but both the indicators are not in agreement, when defining girls and children 2 years or above. Conversely in another study it was concluded that muac is an effective and reliable tool and matches well with WHO standards (Choudhary et al, 2014) wherein they reported 24% children malnourished on basis of muac. In the present study 13.86% children were found to be malnourished on the basis of M/A.

BMI for age

Eight children had low BMI for their age with equal numbers for both the gender. The result indicated that 7.92% children showed thinness. 9.3% boys and 6.89% girls had low BMI/A. On the other hand, 4.95% children were overweight. Gender-wise distribution showed that one (2.3%) boy and 4 (6.89%) girls were found to be overweight i.e. their BMI for age were above +2SD.

Pushpa and Rani (2015) revealed that as per muac12.8% children attending *balwadis* were malnourished and as per BMI, 12.2% male children and 10.4% female children were found in danger zone ie. the values were below -2SD and 7.4% male and 6.1% females were obese. The results for M/A and overweight girls is in agreement with our study.

Table 2: Nutritional status of children attending *anganwadi*

Nutritional parameters	Total children		Girls		Boys	
	N	%	N	%	N	%
W/A (>-2SD)	04	3.96	04	6.89	0	0
H/A (>-2SD)	26	25.74	19	32.75	07	16.27
W/H (>-2SD)	05	4.95	03	5.17	02	4.65
M/A (>-2SD)	14	13.86	02	3.44	12	27.9
BMI/A (>-2SD)	08	7.92	04	6.89	04	9.3
BMI/A (<2SD)	05	4.95	04	6.89	01	2.32

Table 3: Distribution of children according to their nutritional status across gender and age

Age	W/A (>-2SD)		H/A (>-2SD)		W/H (>-2SD)		M/A (>-2SD)		BMI/A (>-2SD)		BMI/A (<2SD)	
	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys
1-2	01	-	09	-	-	-	-	-	-	01	01	-
2^{+}-3	02	-	06	07	-	01	01	02	-	01	02	-
3^{+}-4	01	-	01	-	02	01	01	03	02	02	-	-
4^{+}-5	-	-	03	-	01	-	-	07	02	-	01	01
Total	04	-	19	07	03	02	02	12	04	04	04	01

CONCLUSION AND IMPLICATION

The current research studies the nutritional status of children below 5 attending *anganwadi* in the Sitarganj block of Uttarakhand state. It was found that 3.96% children were underweight, 25.74% were stunted and 4.95% were wasted. Stunting which is associated with long term factors like chronic malnutrition or frequent illness was found to be high.13.86% children had low muac for age, 7.9% children showed thinness and 4.95% children were obese. Although the severity of malnutrition among children under study is not as high as those reported in the other studies, but still zero malnutrition among children should be the ultimate target. This reveals the fact that *anganwadis* in the studied area are working efficiently. But before drawing a conclusive and substantial result, there is a need to conduct more such researches in the *anganwadis* from all the blocks of the state. Also, since malnutrition is associated with multiple etiological factors besides poor access to nutritious food, therefore environmental and socio-demographic factors also need to be studied. There is also a need to concentrate on both forms of malnutrition - undernutrition as well as overnutrition in children as childhood obesity may have repercussion during adult life.

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MICROCLIMATIC FACTORS AFFECTING HDMs PROLIFERATION AND ITS EFFECT ON HOMEMAKERS HEALTH

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ABSTRACT

HDMs are one of the major risk factors that we got from indoor environmental dust. These are present in the various areas of the house especially in the household furniture and furnishings. HDMs proliferation depends on the microclimatic conditions of indoors. The present paper aims to study the microclimatic factors affecting House Dust Mites (HDM) concentration indoors and its effect on homemakers' health. The regression equation highlighted significant difference between the HDMs concentration with temperature, relative humidity and light intensity during summer rainy period. Regression coefficient tvalue explains 75.00 per cent of variation in HDMs due to temperature, RH and light intensity collectively. Homemakers faced varied HDMs related health problems in high humidity during rainy period like wheezing, itching, red rashes etc. Therefore, awareness should be generated among homemakers regarding microclimatic factors affecting HDMs concentration indoors which affect the health status of homemakers.

Keywords: House Dust Mite HDMs (HDMs), Residential Zone (RZ), Commercial Zone (CZ), Industrial Zone (IZ), Relative Humidity (RH), Air Flow Rate (AFR), Light Intensity (LI), Low (L), Moderate (M), High (H).

INTRODUCTION

It is estimated that people spend 90 percent of their time indoors, often at home, breathing clean indoor air which has an important impact on health (Robert et. al., 1992). Insanitary and unhygienic conditions of houses cause dust accumulation in the household furnishings, upholstered furniture, flooring and kitchen corners etc. This accumulated (settled) dust is the major source of HDMs indoors. HDMs are one of the major risk factors that we get from indoor environmental dust which primarily lives on dead skin cells, which arecommonly called dander, which shed regularly from humans and their animal pets (Barbogg, 2003). HDMs proliferation depends on the microclimatic conditions indoors. HDMs are higher in number in areas where there is high humidity and lower light intensity. They just love to live in higher humidity of 70-80 percent and temperatures of 20-30°C in which their development and food consumption increases (Hart et al., 1998). Apart from this, high air flow rate also increases HDMs concentration indoors.

Most of the inmates are not aware of these HDMs as indoor pollutants and unconsciously easily become victim of its health hazards. Estimates are that dust mites may be a factor in 50 to 80 percent asthmatics (Crowther et al., 2001). More recently, causal links have been proven between immunity to HDMs and allergic disorders, including asthma, rhinitis, dermatitis and conjunctivitis (Hewitt et al., 1995). HDMs are the major cause of year round complaints of stuffy nose, sneezing

and watery eyes, what some people describe as a 'permanent cold' (Little, 2003). Hence, the objectives of the present paper are-

1. To ascertain the micro climatic factors which affect the HDMs concentration indoors i.e. temperature, humidity, air flow rate and light intensity.
2. To examine respondents health status in relation to HDMs complications.

METHODOLOGY

The study was conducted in Udaipur city urban area, which comes under the sub- humid southern plains surrounded by Aravalli hills in Rajasthan. The climate of Udaipur is tropical. Lakes, fountains, parks and hills surround Udaipur and its climatic conditions create a suitable environment for the growth of HDMs. A survey of 120 households was conducted to gather information regarding respondents' family background and health complications faced due to HDMs. During summer reason and rainy period (July to September, 2008) observation of indoor microclimatic conditions like temperature, RH, AFR and LI were made with the help of 4 in 1 environmental tester which affects the HDMs concentration indoors. Apart from this attempt was also made to compare the impact of different human activities based on respondents livelihood patterns in different zones viz. residential (RZ), commercial (CZ) and industrial zone (IZ).The incidences of health problems faced by respondents were gathered through interview schedule by the investigator. Two gram of settled dust was collected from four different areas of furniture and furnishings of living, dining, bed rooms and kitchen of the house through electric vacuum cleaner. The dust samples were collected in separate polythene bags, sealed and taken to laboratory within 24 hours to count HDMs under binocular microscope. On the basis mean ± SD of HDMs counts, all the households were divided into three categories as low (L), moderate (M) and high (H) HDMs. Linear regression model was administered to analyse the microclimatic factor affecting indoor HDMs concentration.

FINDINGS OF THE STUDY

The findings of the study are presented as under:

Family Background Information

Family background information of the respondents was collected to analyse the respondents' association with housing factors. Less than two third (60.83 per cent) of the respondents belong to joint families and rest of them (39.17 per cent) to nuclear families. The average size of the respondents families was five members (SD=1.44).The average age of respondents was 45.22 years. One fourth of the respondents were graduates. More than half of the respondents were employed (52.05 per cent) in teaching in government and private schools. To assess the socio-economic status of the respondents' families the worth of the respondents' household assets was calculated. The average worth of respondents' household assets was 19,52,452.00 rupees (SD=15,96,698.00). Data shows that average annual income of the respondents' household was rupees 4,82,158.43 (SD=2,26,173.14).

Micro climatic factors

The mite concentration depends on the ecological requirements like temperature, RH, AFR and light during summers in different areas of the house viz. living, dining, bed room and kitchen which are the prime requisite for successful growth and multiplication of HDMs (Crowther et al,.2000; Modak and Saha, 2002).

Temperature

Changing weather conditions play a vital role in the growth of HDMs (Blythe et al., 1974; Abbott et al., 1981; Hart and Whitehead, 1990; Warner et al., 1993; Saha, 1997). To observe the impact of seasonal variation on HDM growth, the temperature of respondents' house in different rooms was recorded in rainy season.

Living room: Average temperature of the respondents' living rooms was 24.71˚C (SD=3.07 ˚C). In RZ respondents' living room temperature (25.59 ˚C) was found to be higher than the average as compared to IZ (25.34˚ C) and CZ (23.21˚C). Intra zonal variation showed higher temperature of respondents' living room in moderate HDMs category of RZ (25.86˚ C) and CZ (23.82˚ C).

Dining room: The average temperature in respondents' dining room was 25.29˚ C (SD=2.48˚C) in summer. Not much variation was found in all the three zones dining room temperature (RZ=25.58˚C, CZ=24.42˚C and IZ= 25.89˚C) in summer season. Respondents having higher than the average temperature of dining room fall in moderate HDM category of RZ (25.77˚ C) and of CZ (25.50˚C) and higher HDM category of IZ (25.93˚C).

Bedroom: Table 1 shows that the average temperature of respondents' bedroom was 25.39˚ C (SD=2.79˚C) in summer season. Inter zonal variation highlighted higher than the average temperature of bedroom in IZ (26.30˚ C) and RZ (25.65˚ C) as compared to CZ (24.72˚ C). Moreover, respondents having higher than the average bed room temperature belonged to moderate HDM category of RZ (26.00˚C) and lower HDM category of IZ (27.77˚C). However, CZ respondents belonging to higher HDM category had lower than the average bedroom temperature (24.83˚ C)

Kitchen: Data in Table 1 revealed that the average temperature of respondents kitchen in summers was 25.28˚ C (SD= 2.37). Inter zonal variation showed higher than the average temperature of respondents' kitchen in RZ (26.03˚C) and IZ (25.51˚C) than CZ (24.31˚C). Respondents having higher than the average temperature of their kitchen belonged to lower HDM category of CZ (25.11˚C) and IZ (26.25˚C) and moderate HDM category of RZ (26.12˚C). On the contrary the lowest temperature of respondents' kitchen was in high HDM category of RZ (25.66˚C) and IZ (24.90˚C).

Table 1: Average indoor temperature of respondents' different rooms

S. No.	Temperature of rooms (˚C)	RZ				CZ				IZ				Grand Total N=120
		L n=10	M n=27	H n=3	Total N=40	L n=9	M n=25	H n=6	Total N=40	L n=4	M n=31	H n=5	Total N=40	
1.	**Temperature**													
a.	**Living room**													
	Mean	25.26	25.86	24.20	25.59	22.44	23.82	21.85	23.21	25.77	25.26	25.48	23.34	24.71
	SD	1.70	1.80	0.72	1.76	4.90	3.96	5.36	4.35	2.43	1.89	0.32	1.80	3.07
b.	**Dining room**													
	Mean	25.46	25.77	24.33	25.58	24.37	25.50	24.41	27.22	25.70	25.70	25.98	25.89	25.29
	SD	1.45	1.82	1.15	1.70	3.66	3.10	1.64	3.05	2.03	2.41	1.72	2.30	2.48
c.	**Bed Room**													
	Mean	25.30	26.00	23.66	25.65	24.00	24.16	24.83	24.72	27.77	26.09	24.42	26.30	25.39
	SD	2.33	3.64	3.21	3.38	2.82	2.82	1.72	2.68	1.13	1.79	0.90	1.70	2.79
d.	**Kitchen**													
	Mean	25.91	26.12	25.66	26.03	25.11	24.01	24.36	24.31	26.25	25.5	24.90	25.51	25.28
	SD	2.13	2.30	4.04	2.33	2.57	2.87	2.89	2.77	2.06	1.58	1.10	1.57	2.37

Thus in the rainy season temperature of respondents' different rooms was ranging from 24.71 ˚C to 25.39 ˚C which is an ideal condition for HDMs growth. Several studies also reported that in summer season the most suitable temperature for mites survival is in between from 20-30˚C (Hart, 1998; Barbogg, 2003).

Humidity

In microbial culture, survival of mites depends upon the RH. There is a significant association between RH and presence of live HDMs (Charpin and Vervloet, 1990). An increase in RH leads to an increase in average development time of HDMs at all stages of life cycle (Arlian et al. 1983, Colloff, 1987). Indoor RH of respondents' houses was taken to identify its effect on HDMs growth.

Living room: In summer season average RH of respondents' living room was 66.54 per cent (SD=1.70). RH was found to be higher in IZ (67.15 per cent) as compared to other zones (RZ=66.02 per cent and CZ=66.45 per cent). Higher than the average living room RH (67.66 per cent) was observed in high HDM category of CZ. In RZ respondents' falling in high HDM category had higher than average RH of living room (66.33 per cent). In IZ the lower HDM category respondents' houses had higher than average RH (68.25 per cent) of living room. Several researchers also reported that HDM grows well in the dust at 45 -80 per cent of RH (Shivpuri and Dua 1974; Shivpuri, 1977).

Dining room: Average RH of respondents' dining room was 65.87 per cent (SD=1.31). Among all the three zones average RH was higher in IZ (66.25 per cent) and CZ (65.87 per cent) as compared to RZ (65.50 per cent). In high HDM category of RZ (65.66 per cent) and CZ (66.33 per cent) average RH of respondents' dining room was found to be higher. Lower HDM category respondents had higher RH (66.50 per cent) in IZ.

Bedroom: The average RH of respondents' bedroom in summer season was 67.58 per cent (SD=2.36). Average RH of respondent's bedrooms was found higher in IZ (67.92 per cent) as compared to RZ (67.32 per cent) and CZ (67.50 per cent). Intra zonal variation revealed that in higher HDM category of CZ respondents' bed room had higher than the average RH (69.83 per). Thus it can be said that mattresses in the bedroom retain moisture for longer periods therefore, provide a more suitable habitat for HDM. In RZ respondents of moderate HDM category had higher than the average RH (67.92 per cent) in bedroom. Warner et al. (1999) also found a significant association between the maximal mite count and RH of bedrooms.

Table 2: Average indoor RH of respondents' different rooms

S. No.	RH of rooms(in per cent)	RZ				CZ				IZ				Grand Total N=120
		L n=10	M n=27	H n=3	Total N=40	L n=9	M n=25	H n=6	Total N=40	L n=4	M n=31	H n=5	Total N=40	
1	**Humidity**													
a.	**Living room**													
	Mean	65.20	66.29	66.33	66.02	66.33	66.20	67.66	66.45	68.25	66.96	67.40	67.15	66.54
	SD	1.48	1.56	2.30	1.62	1.32	1.41	2.16	1.56	2.36	1.74	1.51	1.77	1.70
b.	**Dining room**													
	Mean	65.10	65.62	65.66	65.50	65.55	65.88	66.33	65.87	66.50	66.19	66.40	66.25	65.87
	SD	1.20	1.11	1.15	1.14	1.01	1.30	1.75	1.30	1.73	1.40	1.67	1.42	1.31
c.	**Bed room**													
	Mean	65.60	67.92	67.66	67.32	67.66	66.88	69.83	67.50	68.50	67.90	67.60	67.92	67.58
	SD	1.57	2.23	3.05	2.32	2.73	2.16	2.31	2.49	2.64	2.38	1.81	2.30	2.36
d.	**Kitchen**													
	Mean	64.90	66.92	67.00	66.42	66.88	66.60	69.16	67.05	68.25	67.29	67.40	67.40	66.95
	SD	0.56	2.03	2.64	1.99	1.69	1.82	2.31	2.03	2.36	1.98	1.51	1.94	2.01

Kitchen: Average RH of respondents' kitchen in summer season was 66.95 per cent (SD= 2.01). Inter zonal variation revealed that respondents' kitchen RH was more than average in CZ (67.05 per cent) and IZ (67.40 per cent) as compared to RZ (66.42 per cent). Intra zonal variation showed that respondents' kitchen RH was higher than the average in high HDM category of RZ (67.00 per cent) and CZ (69.16 per cent). It can be due to high water vapour content in kitchen air while cooking which increases the moisture and helps in the concentration of HDMs.

The RH of respondents' different rooms was in between 66.54 to 67.58 per cent. During favourable conditions of humidity and temperature HDMs osmoregulate from the surface cuticle (Layon, 2004). Corroborated inferences were also drawn by several researchers that HDM grows well in the dust at 45 -80 per cent of RH (Shivpuri and Dua 1974; Blithe, 1976; Shivpuri, 1977; Carswell, 1982; Hunter, 1996; Lakshmi and Hao, 1999; Singh and Rao, 2001).

Air Flow Rate (AFR)

Dust accumulation in the house depends upon the AFR. It has been estimated that 20 per cent of the dust that comes in the house is accumulated through air flow. This settled dust is the main reason for the occurrence of HDMs the most common human habitat (Alan, 2003).

The dust accumulation and resuspension is readily influenced by the air flow patterns and activities taking place in the area (Thatcher et al., 1995). During summer AFR was measured without fans so that the HDMs concentration due to natural AFR can be taken.

Living room: Data in the Table 3 explicitly showed that average AFR of respondents' living room was 0.74 m/sec. (SD=0.56). The average AFR of respondents' living room was higher in IZ (0.80 m/sec.) as compared to RZ (0.75 m/sec.) and CZ (0.67 m/sec.). It can be ascribed to the fact that most of the houses in IZ were detached types and situated in open areas, due to which circulation of air was more. Increased AFR was observed in higher HDM categories of RZ (0.80 m/sec.) and IZ (0.90 m/sec.) of respondents' living room.

Dining room: Average AFR of respondents' dining room was 0.83 m/sec. (SD=0.64). Respondents of IZ were found to have higher than the average AFR (1.00 m/sec.) of dining room as compared to other zones (CZ=0.64 m/sec. and RZ=0.84 m/sec.). The dining room AFR was found to be higher in higher HDM categories of RZ (1.06 m/sec.) and IZ (1.04 m/sec.). It can be said that higher AFR increases the HDMs concentration in home. However, increased AFR of dining room was observed in lower HDM category of CZ (0.75 m/sec.).

Bedroom: During summer, average AFR in respondents' bedroom was 0.77 m/sec. (SD=0.51). Inter zonal variation revealed increased average AFR of respondents' bedroom (0.93 m/sec.) in RZ than other zones (IZ=0.71 m/sec. and CZ=0.68 m/sec.). Intra zonal variation highlighted that in all the three zones, increased AFR of respondents' bedroom was observed in high HDM categories of all the three zones (RZ= 1.30 m/sec. , CZ= 0.73 m/sec. and IZ= 1.22 m/sec.). It can be concluded that high AFR encourages HDMs growth in the bedroom.

Kitchen: The overall average AFR of respondents' kitchen was 0.90 m/sec. (SD=0.53). Increased average AFR of respondents' kitchen was observed in IZ (1.04 m/sec.) as compared to other zones (RZ= 0.94 m/sec., CZ=0.74 m/sec.). Intra zonal variation reflected higher AFR (0.90 m/sec.) in respondents' kitchen of higher HDM category in CZ. Furthermore, in IZ moderate HDM category respondents had higher AFR (1.10 m/sec.) in their kitchens.

The AFR of the respondents' houses depends upon the outer air flow pattern (Warner et al., 1999). The increased AFR brings more dust in indoors which increases HDMs in settled dust. At the same time HDMs flow from one place to another also increases.

Table 3: Average indoor AFR of respondents' different rooms

S. No	AFR (in m/sec.)	RZ				CZ				IZ				Grand Total N=120
		L n=10	M n=27	H n=3	Total N=40	L n=9	M n=25	H n=6	Total N=40	L n=4	M n=31	H n=5	Total N=40	
	Indoors													
1	**Air flow rate**													
a.	**Living room**													
	Mean	0.68	0.76	0.80	0.75	0.20	0.72	0.68	0.67	0.72	0.82	0.90	0.80	0.74
	SD	0.58	0.59	0.65	0.58	0	0.59	0.65	0.58	0.54	0.52	0.60	0.52	0.56
b.	**Dining room**													
	Mean	0.78	0.80	1.06	0.84	0.75	0.60	0.70	0.64	0.92	1.00	1.04	1.00	0.83
	SD	0.67	0.68	0.67	0.66	0.64	0.59	0.69	0.60	0.72	0.61	0.76	0.62	0.64
c.	**Bed room**													
	Mean	1.04	0.85	1.30	0.93	0.68	0.67	0.73	0.68	0.35	0.68	1.22	0.71	0.77
	SD	0.55	0.59	0.17	0.56	0.48	0.48	0.51	0.47	0.17	0.46	0.40	0.47	0.51
d.	**Kitchen**													
	Mean	1.01	0.92	0.93	0.94	0.85	0.68	0.90	0.74	0.82	1.10	0.82	1.04	0.90
	SD	0.50	0.54	0.51	0.52	0.56	0.54	0.60	0.54	0.73	0.48	0.56	0.51	0.53

Light intensity

HDMs prefer dark and shady places in the house. Light intensity is one of the main limiting factors for the HDMs growth. Indoor light intensity of respondents' different rooms was measured to examine its effect on HDMs growth.

Living room: During summer, average light intensity of respondents' living room was 45.72 Lux (SD=17.56). Inter zonal variation showed that in CZ respondents' living room had lower light intensity (31.90 Lux) as compared to RZ (41.06 Lux) and IZ (64.21 Lux). Intra zonal variation showed that lower HDM category respondents had lesser light intensity of living room in RZ (36.75 Lux)). Conversely, higher light intensity was observed in lower HDM category of respondents' living room in CZ (33.20 Lux).

Dining room: The overall average light intensity of respondents' dining room was 36.61 (SD=12.80 Lux). Light intensity of respondents' dining room was found to be lower in CZ (30.92 Lux) and RZ (32.32 Lux) as compared with IZ (46.60 Lux). Inter zonal variation revealed that lower HDM category of RZ (32.30 Lux) and moderate HDM category of CZ (30.16 Lux) had low light intensity of dining room.

Table 4 : Average light intensity of respondents' different rooms

S. No.	Light intensity of rooms (in Lux)	RZ				CZ				IZ				Grand Total N=120
		L n=10	M n=27	H n=3	Total N=40	L n=9	M n=25	H n=6	Total N=40	L n=4	M n=31	H n=5	Total N=40	
1	**Light intensity**													
a	**Living room**													
	Mean	36.75	42.05	38.40	41.06	33.20	31.74	29.00	31.90	56.22	66.57	66.33	64.21	45.72
	SD	1.30	11.95	1.34	10.67	4.51	4.77	3.46	4.65	19.18	13.61	14.86	15.39	17.56
b	**Dining room**													
	Mean	32.30	32.51	39.66	32.32	34.75	30.16	35.00	30.92	49.24	45.37	47.7.3	46.60	36.61
	SD	7.57	2.29	6.65	7.15	3.94	3.89	0	3.94	18.10	16.89	16.13	16.70	12.80
c	**Bedroom**													
	Mean	39.20	38.40	37.00	38.50	37.88	37.20	37.00	37.32	52.50	59.48	57.60	58.55	44.79
	SD	11.34	11.80	13.45	11.49	8.32	7.88	7.74	7.76	15.60	11.56	15.05	12.22	14.41
d	**Kitchen**													
	Mean	42.80	43.11	41.66	42.92	37.88	37.20	37.00	37.32	52.50	59.48	57.60	58.55	46.26
	SD	10.52	11.53	14.57	11.19	8.32	7.88	7.74	7.76	15.60	11.56	75.05	12.22	13.82

Bedroom: During summer, average light intensity of respondents' bedroom was 44.79 Lux (SD=14.41). Inter zonal variation showed that respondents of RZ (38.50 Lux) and CZ (37.32 Lux) had less than average light intensity of bedroom as compared to IZ (58.55 Lux). Intra zonal variation showed that respondents of lower HDM category in RZ (39.20 Lux) and CZ (37.88 Lux) had intense light.

Kitchen: Average light intensity of respondents' kitchen in summer was 46.26 Lux (SD=13.82). Lower than the average light intensity of RZ (42.92 Lux) and CZ (37.32 Lux) was observed in the respondents' kitchen as compared to IZ (58.55 Lux). Respondents having low intensity of kitchen light belonged to high HDM categories in RZ (41.66 Lux) and CZ (37.00 Lux).

The data reflected that in summer's rainy period kitchen and dining rooms' light intensity was higher than the other rooms. The lower light intensity encourages HDMs to develop whereas intense light lowers HDMs (Lakshmi and Haq, 1999).

The microclimate of different rooms postulated that temperature, RH, AFR and light intensity was higher in IZ which can be related to houses situated in open areas. Apart from this, industrial houses had more open areas. Higher AFR in this area brings more dust inside the house. High humidity of IZ can be attributed to nearby water reservoir (UdaiSagar). High humidity in CZ can be related to congested ill ventilated houses and low light intensity which create ideal conditions for the HDMs growth.

Relationship of microclimatic factors and HDMs

To test the correlation between seasonal variation in HDMs concentration with different microclimatic factors (temperature, RH, AFR and light) leaner regression equation (Y=a+b1x1+b2x2+b3x3+b4x4) was used.

The regression equation highlighted a significant difference between the HDMs concentration with temperature (t= 2.14, sig. level 0.05), RH (t= 2.02, sig. level 0.05) and light intensity (t=2.95, sig. level 0.01) during summer season. Regression coefficient value explains 75.00 per cent of variation in HDMs due to four independent variables i.e. temperature, RH, AFR and light intensity collectively and rest (36.00 per cent) of the variation could not explained by these variables.

Table 5: Regression equation for HDMs concentration with various microclimatic factors

S No.	Coefficients	Unstandardized Coefficients		Standardized Coefficients	t value
		B	Std. Error	Beta	
	Season				
1	Light	0.256	0.087	0.276	2.95**
2	Temperature	0.397	0.123	0.187	2.14*
3	Humidity	0.147	0.073	0.182	2.02*
4	Air flow rate	0.201	1.609	0.011	0.12NS

NS Non Significant
* Significant at 0.05 level of probability
** Significant at 0.01 level of probability

This may be attributed to the rainy period in which temperature becomes low, high humidity and low light intensity which creates favorable environment for high HDMs concentration. Several researchers also substantiate these findings that favorable temperature and RH is an important factor in the development of mites at all stages. HDMs hide in dark places so light intensity is also important factor in their growth. (Hart, 1998; Custonic et al., 1998; Lakshmi and Haq, 1999; Crowther et al, 2001).Statistical test results showed that micro climatic factors like temperature, humidity and light intensity affect HDMS concentration during summer rainy period. It was observed that in rainy period micro climatic conditions favoured HDMs proliferation indoors.

Health complications due to HDMs

Different types of complications are faced by respondents through HDMs. These are-

Wheezing: Wheezing is a high pitched whistling sound while breathing. Risk of wheezing also associated with HDMs allergens indoors (Jedrychowski et al; 2007). Appraisal of the Table 6 reflected that nearly about two third of the respondents (67.50 per cent) faced wheezing problem during high humidity. This problem was higher in IZ (85 per cent) as compared to other zones (RZ=47.50 per cent, CZ=70 per cent). Cent percent of the high HDM category respondents among all the three zones faced wheezing problem during high humidity conditions.

Coughing: Coughing is the commonest condition that may trigger through HDMs (Little, 2003; Sharma, 2009). Nearly two third of the respondents faced coughing problem seasonally in all the three zones (RZ=62.50 per cent, CZ=66 per cent and IZ=65 per cent). Respondents face coughing problem seasonally. Most of the high HDM category respondents (RZ=66.07 per cent, CZ=66.07 per cent, IZ=80 per cent) faced coughing problem. One third of the RZ respondents belonged to high HDM category faced the HDMs problem throughout the year.

Shortness of breath: This complicated HDMs respiratory problem, occurs mostly in high humid conditions (Jock et al., 1994). Shortness of breath was found seasonally by 70.83 per cent of the respondents. A small percentage of the respondents (17.5 per cent) faced it throughout the year and after rainfall. Higher HDM category respondents of IZ (100 per cent) and RZ (66.07 per cent) faced shortness of breath problem seasonally.

Shortness of breath with wheezing: In severely affected HDMs conditions, complications may occur in a lot of combinations i.e. shortness of breath with wheezing or coughing. Children in urban area exposed to HDMs suffered from shortness of breath with wheezing and woke up with respiratory symptoms (Zock et al. (1994). About three fourth of the respondents (72.50 per cent) faced the problem of shortness of breath with wheezing after rainfall. One third of the respondents belonging to high HDM category had shortness of breath and wheezing problem when humidity was high. In IZ 60 per cent of high HDM category, respondents seasonally faced shortness of breath with wheezing problem. Asthma is more prevalent in underdeveloped urban area and among industrialized urban communities (Saha, 1997).

Wake up with respiratory problem: HDMs can cause respiratory problems when they wake up in the morning due to difficulty in respiration. Higher percent of respondents in all the three zones (RZ=45 per cent, CZ=7.50 per cent and IZ=67.50 per cent) wake up with respiratory problems generally in high humidity. Respondents of high HDM category in CZ wake up with respiratory problem after the rainfall. Respiratory allergies are caused by the inhalation of dead or alive mites (Nadchatram, 2005).

Common cold: The symptoms and signs of an allergic reaction to HDMs are similar to common cold or hay fever (www.indoor-allergies.suite 101.com). Cold was common problem in all the three zones. Most of the respondents in RZ (66.07 per cent) of high HDM category faced this problem after rainfall. Cent percent of low HDM category respondents in CZ and 80 per cent of moderate HDM category respondents of IZ faced cold problem throughout the year.

Harshness of voice: It refers to abnormally rough or harsh sounding voice caused by vocal abuse and allergy to substances like HDMs and pollens (www.nasal.net.com). Harshness of voice was faced by majority of the respondents in all three zones throughout the year (RZ=62.07 per cent, CZ =90 per cent and IZ=87.05 per cent). Cent percent of higher HDM category respondents in IZ and lower HDM respondents in CZ face harshness of voice problem during high humidity conditions.

Common fever and sweating: Common fever and sweating problem were high (75.83 per cent) among all the three zones respondents (RZ=62.05 per cent, CZ=77.05 per cent and IZ=87.05 per cent) after the rainfall. During high humidity, higher HDM category respondents of RZ (66.07 per cent) and CZ (83.03 per cent) faced this problem.

Table 6: Distribution of respondents according to incidences of complications associated with HDMs

S. No.	Incidences of complications	RZ				CZ				IZ				Grand Total N=120
		L n=10	M n=27	H n=3	Total N=40	L n=9	M n=25	H n=6	Total N=40	L n=4	M n=31	H n=5	Total N=40	
1.	**Wheezing**													
	Throughout year	30.00	37.00	0	32.05	11.05	24.00	0	17.05	0	19.04	0	15.00	21.66
	After rainfall	20.00		0	5.00	22.2	4.00	0	7.50	0	0	0	0	4.16
	In high humidity	50.00	40.70	100	47.05	66.07	64.00	100	70.00	100	80.6	100	85	67.5
	Seasonally	0	22.20	0	15.00	0	8.00	0	5.00	0	0	0	0	6.66
2.	**Coughing**													
	Throughout year	40.00	25.90	33.30	30.00	11.01	8.00	0	7.50	25.00	12.09	0	12.50	16.66
	After rainfall	10.00	3.70	0	5.00	22.20	12.00	0	12.50	50.00	9.70	20.00	15.00	10.83
	In high humidity	0	3.70	0	2.50	44.40	0	33.30	15.00	25.00	6.50	0	7.50	8.33
	Seasonally	50.00	66.70	66.70	62.50	22.20	80.00	66.07	65.00	0	71.00	80.00	65.00	64.16
3.	**Shortness of breath**													
	Throughout year	40.00	14.80	33.30	22.50	0	16.00	50.00	17.50	25.00	12.90	0	12.50	17.50
	After rainfall	0	22.20	0	15.00	0	12.00	0	7.50	25.00	12.90	0	12.50	17.50
	Seasonally	60.00	63.00	66.70	62.50	100	72.00	50.00	75.00	50.00	74.20	100	75.00	70.83
4.	**Shortness of breath plus wheezing**													
	Throughout year	40.00	18.50	33.03	25.00	0	0	0	0	0	0	0	0	8.33
	After rainfall	40.00	77.80	33.03	65.00	77.08	88.08	66.07	82.05	50.00	77.04	40.00	70.00	72.05
	In high humidity	20.00	3.07	33.03	10.00	22.02	4.00	33.03	12.05	25.00	6.05	0	7.05	10.00
	Seasonally	0		0	0	0	8.00	0	5.00	25.00	16.01	60.00	22.05	9.16
5.	**Wake up with respiratory symptoms**													
	Throughout year	0	11.10	0	7.50	11.10	0	0	2.50	0	0	0	0	3.33
	After rainfall	10.00	7.04	33.03	10.00	0	24.00	0	15.00	0	22.60	20.00	20.00	15.00
	In high humidity	50.00	44.04	33.03	45.00	88.09	64.00	100	75.00	100	64.00	60.00	67.05	62.05
	Seasonally	40.00	37.00	33.03	37.05	0	12.00	0	7.05	0	12.09	20.00	12.05	19.16
6.	**Common cold**													
	Throughout year	40.00	55.06	0	47.05	100	92.00	66.07	90.00	75.00	80.06	60.00	77.50	71.66

	After rainfall	10.00	22.20	66.07	22.50	0	0	0	0	25.00	3.20	0	5.00	9.16
	In high humidity	30.00	14.08	0	17.05	0	4.00	16.07	5.00	0	12.09	20.00	12.50	11.66
	Seasonally	20.00	7.04	33.03	12.05	0	4.00	16.07	5.00	0	3.02	20.00	5.00	7.50
7.	**Harshness of voice**													
	After rainfall	0	22.20	0	0	0	12.00	16.07	10.00	25.00	12.09	0	12.50	7.50
	In high humidity	40.00	14.08	33.30	22.50	0	0	0	0	0	0	0	0	7.50
	Seasonally	60.00	63.00	66.07	62.07	100	88.00	83.03	90.00	75.00	87.01	100	87.05	80.00
8.	**Common fever and sweating**													
	Throughout year	40.00	18.50	33.03	25.00	0	0	0	0	0	0	0	0	8.33
	After rainfall	50.00	66.07	66.07	62.05	77.08	76.00	83.03	77.05	100	87.01	80.00	87.05	75.83
	In high humidity	10.00	14.08	0	12.05	22.02	24.00	16.07	22.05	0	9.07	20.00	10.00	15.00
	Seasonally	0	0	0	0	0	0	0	0	0	3.02	0	2.05	0.83
9.	**Itching**													
	Throughout year	40.00	18.50	33.03	25.00	0	8.00	0	5.00	25.00	6.50	0	7.50	12.50
	After rainfall	0	14.08	33.03	12.05	11.01	8.00	0	7.50	0	0	20.00	2.50	7.50
	In high humidity	60.00	66.07	33.03	62.05	88.09	84.00	100	87.05	75.00	93.05	80.00	90.00	80.00
10.	**Red rashes on skin**													
	Throughout year	40.00	18.05	33.03	25.00	0	8.00	0	5.00	25.00	6.50	0	7.50	12.50
	After rainfall	0	14.08	33.03	12.05	11.01	8.00	0	7.50	0	0	20.00	2.50	7.50
	In high humidity	60.00	66.07	33.03	62.05	88.09	84.00	100	87.05	75.00	93.05	80.00	90.00	80.00
11.	**Head aches**													
	Throughout year	50.00	59.03	100	60.00	55.06	72.00	66.07	67.05	50.00	71.00	100	72.05	66.66
	After rainfall	0	3.07	0	2.05	11.01	4.00	0	5.00	50.00	25.08	0	25.00	10.83
	In high humidity	30.00	14.08	0	17.05	22.02	20.02	0	17.05	0	3.02	0	2.05	12.05
	Seasonally	20.00	22.02	0	20.00	11.01	4.00	33.03	10.00	0	0	0	0	10.00
12.	**Fatigue**													
	Throughout year	50.00	48.01	33.03	47.05	88.09	84.00	66.07	82.05	75.00	87.01	80.00	85.00	71.66
	After rainfall	30.00	22.02	33.03	25.00	0	0	0	0	0	0	0	0	8.33
	In high humidity	0	11.10	33.03	10.00	0	12.00	0	7.50	0	6.50	20.00	7.50	8.33
	Seasonally	20.00	18.50	0	17.50	11.10	4.0	33.30	10.00	25.00	6.50	0	7.50	11.66

13.	**Watery eyes**												
	Throughout year	30.00	18.50	33.03	22.50	0	0	0	0	0	0	0	0	7.50
	After rainfall	0	3.07	0	2.50	22.02	12.00	0	12.05	0	16.01	20.00	15.00	10.00
	In high humidity	70.00	77.08	66.07	75.00	66.07	76.00	100	77.05	100	83.09	80.00	85.00	79.16
	Seasonally	0	0	0	0	11.01	12.00	0	10.00	0	0	0	0	3.33

Itching: Dirty skin may also become a perfect breeding place for skin diseases like itching, eczema etc. Moist body parts with perspiration give a preferable environment for the growth of tropical fungus and HDMs (Stella, 1974). Severity of skin diseases depends on the concentration HDMs in the dust (Beck et al., 1989). In high humidity, itching problem was faced by most of the respondents in all the three zones (RZ=62.05 per cent, CZ=87.05 per cent and IZ=90 per cent). High HDM category respondents in CZ (100 per cent) and IZ (80 per cent) face itching problem during high humidity. One third of the respondents of high HDM category in RZ faced the itching problem after rainfall.

Red rashes on skin: Most of the respondents in IZ (90 per cent) faced red rashes problems as compared to other zones (RZ=62.05 per cent, CZ=87.05 per cent) during high humidity. Majority of the respondents of higher HDM category (CZ=100 per cent, IZ=80 per cent) faced red rashes problem during high humidity.

Headaches: Headaches, fatigue and depression are the signs of allergic reactions from HDMs (Lyon, 1991). Two third of the respondents had headache problem throughout the year and it was higher in IZ (72.05 per cent) as compared to RZ (60 per cent) and IZ (67.05 per cent). Moreover, two third of the respondents in CZ and cent percent in RZ and IZ belonging to high HDM category had headache throughout the year.

Fatigue: Majority of the respondents in IZ (85 per cent) and CZ (82.50 per cent) had fatigue problem throughout the year and this problem was more common among respondents' belonging to moderate HDM category in CZ (84 per cent) and IZ (87.10 per cent). Convergent results were also reported by Khatri (2006) that fatigue was faced by women during the time of low humidity (25 percent) and seasonal variation (20 percent).

Watery eyes: When the surface of eyes is exposed to HDMs allergens an allergic reaction occurs causing red, itchy and watery eyes. Watery eyes are the commonest problem caused by HDMs that was faced by more than three fourth of the respondents (79.16 per cent) after the rainfall. In this period respondents of high HDM category in all three zones faced the watery eyes problem (RZ=77.08 per cent, CZ=77.50 per cent and IZ=85 per cent). One tenth of the respondents in CZ seasonally faced watery eyes problem. Several researchers also reported significant role of mites in the house dust responsible for health hazards such as respiratory allergy, nasobronchial, nasal and skin allergy in sensitive individuals (Shivpuri and Dua, 1974; Anand, 1981; Sharma et al., 2009).

Respondents faced these complications throughout the year but the severity of these complications varies from individual to individual, as well as these symptoms are severe during high humidity rainy period. This can be related to the occurrence of seasonal rises in their

population often reaching peak development during rainy season (Tilak and Jagdand; 1989). Significant correlation was also found by Sharma et al., (2009) between the severity of allergic diseases and indoor concentrations of mites.

CONCLUSION

Thus it can be concluded that with ideal microclimatic conditions like temperature, relative humidity, light intensity HDMs proliferate. These HDMs are harmful for human health. They are the causative factor of severe complications that occur due to HDMs but homemakers are ignorant about these micro-organisms. Hence, policy framers, architects and civil engineers should emphasize on proper planning of houses with emphasis on proper microclimatic factors which reduce HDMs proliferation. Awareness among homemakers should be generated regarding harmful effect of HDMs which will be helpful in reducing the incidences of health complications.

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WOMEN ENTREPRENEURSHIP - SUCCESS STORIES

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ABSTRACT

Women entrepreneurship is becoming significantly a progressive economic practice in India. It plays a prominent role in economic development through commercialisation of new ideas. Today, women entrepreneurs account for upto a third of all businesses operations in the formal economy worldwide. This research makes a significant contribution to an in depth understanding of how women are making efforts and exhibiting their capabilities for national economic development and for their own enhanced living standards by taking part in various economic activities. The study was carried out as a field study in Chittoor district and personal interviews were carried out with women entrepreneurs to collect the case studies through a structured case - study tool. The case studies revealed that there is a substantial improvement in overall status of women in the family and they succeeded to prove their abilities as entrepreneurs.

Keywords: Entrepreneurship, Women, Economic development, Decision making

INTRODUCTION

Entrepreneurship has been highlighted as a useful tool for fostering women's empowerment and hence the promotion of women entrepreneurship has been a prominent approach in recent days. In India the status of women has long been paradoxical. They were in the professions like medicine, teaching and politics. In some societies women are very powerful. In recent years women are seen taking part in entrepreneurial activities.

Women entrepreneurs are essential for a healthy entrepreneurial ecosystem and healthy economic growth. There is still a long way to go. Women led businesses, only make up 30 percent of companies around the world. In India only 14 percent business establishments in the country are being run by female entrepreneurs and most of these women run enterprises are small- scale. The women entrepreneurs are increasing with the government implementing schemes(Rajani,2008).

Entry of women in entrepreneurial activities is seen in respect of all kinds of women both in rural and urban areas (Rajani, 2008). Women are engaged in both traditional and non-traditional activities. The economic, social, religious, cultural and psychological factors affect organisations and the success of women entrepreneurs (Habib, Roni, Haque, 2005). In the developing economies like India, women are involved in collaborative entrepreneurship to gain financial, social and psychological empowerment (Datta and Gailey 2012). The success stories in the entrepreneurial world improved their bargaining power in family, decision making power and

understanding of personal actions. (Minniti, Arenius and Longowitz, 2005). Research conducted by Bosna and Harding, 2006 found entrepreneurial orientation was higher among women in developing economies as compared to developed countries. Women's entry into the entrepreneurship field has witnessed good business, social and personal life. (Ufuk and ozgen, 2001). Undoubtedly entrepreneurship is a result oriented profession to secure empowerment among women (Abbasian and Bildt, 2009).

BACKGROUND OF THE STUDY

OBJECTIVE AND METHODOLGY

There is a need for in-depth analysis of cases to understand the entrepreneurial process of women hence, with this aim a research was conducted. The paper highlights the cases of successful women entrepreneurs who have struggled and made a mark for themselves in the society. The present study which was descriptive-cum- exploratory in nature has been conducted through survey method. Totally 802 women entrepreneurs registered under various government schemes in Chittoor district of Andhra Pradesh were surveyed for their productive activities**.**

The details of women entrepreneurs involvement in each sector is given in table:1

Table 1: Sector wise details of women entrepreneurs

S.No.	Sector	Sample size				
		Micro	**Small**	**Medium**	**Large**	**Total**
1	Service	110	36	1	1	148
2	Production	175	8	4	3	190
3	Business	232	221	11	0	464
	Total	517	265	16	4	802

From this larger number of women included in the study based on their reponses and economic productivity along with entrepreneurial satisfaction, four women were selected for in depth case analysis by the researcher. Case studies are presented in greater details as follows.

CASE STUDIES

Case study 1 – Syamala Sarees (Business Sector)

Socio-economic demographic profile

Syamala, a resident of Puttur is a saree and garment seller. She is a 46 years old, married woman with two children aged 24 years and 21 years respectively. Her father and her brothers are in textile business. Her sisters are house wives. Syamala studied up to graduation and completed a diploma in textiles and clothing. Her husband is a realtor and she is living in a nuclear family. She has a shop and conducts her business from home as well. Syamala belongs to a middle class family and has been in business for last 10 years and is contributing to family income regularly.

Business idea conception and Entrepreneurial Productivity

After marriage Syamala came to Puttur with her husband. Syamala faced financial problems in her family after birth of her children. Her husband also had problems in his business. Her household responsibilities and expenses both were increasing. Syamala thought of doing some work that would enable her to earn some income for the family. Her brother gave her an idea to start selling sarees. In the beginning she started her business from home. She along with her brother went to different shops in Hyderabad, Surat and Chennai to know about different sarees. She bought sarees at wholesale rate and started her business by investing Rs.40,000/-.

Initially she faced problems such as quoting price, bargaining, recovery etc. since she was new to the business. But she was fortunate to get a sizeable number of customers. During the course of time she got experience of the business and knowledge regarding preferences of customers. By recognising the taste of customers and introducing new varieties of dresses slowly she became more popular and started a shop to overcome her business and personal problems. But when she was at the peak, she faced some family problems also and was unable to pay attention to her business and had to bear loss also. Even then she didn't give up her business, she approached a bank with the help of a family friend and succeeded to get financial support of Rs.10,00,000/-. Again her business started growing and thereby earnings also increased. Due to her skill, talent and determination her business has made good progress.

Her children are grown up now. Both her children along with her husband are helping her in business. Along with sarees and dresses store, she started a fancy store with women accessories. She registered her business and is a regular tax payer since its establishment. She is satisfied with the support given by financial institutions to encourage women entrepreneurs.

Future plans

Her plan is to open a big show room so that her children may not face any problem in future to continue her business.

Impact

Syamala feels that she is self sufficient now and stated that her business has not only given her money but good status in family as well as in the society.

Case analysis

Syamala entered into entrepreneurial field to overcome her financial problems. Her desire to do something to support her family motivated her to start her business. Her management, timely decisions, human relation skills combined with family support made her a successful woman entrepreneur.

Case study 2 - Padmavathi Footwear(Production Sector)

Socio-economic and demographic profile

Padmavathi is a resident of Lakshmipuram, a semi urban place near Tirupati. She is in her mid-fifties and has studied upto 10^{th} standard. Both her parents who were engaged in leather business expired. She is the only daughter to her parents and she had observed as well as participated in their business activities. She is married and her daughter is 32 years old. She lives in a nuclear family with her husband and daughter. Her husband works in a private company. From the brief history of Padmavathi given above, it is evident that she had some business experience as she had helped her parents in their business.

Business idea conception and Entrepreneurial Productivity

Padmavathi is engaged in leather chappals making. As her husband's income was insufficient, a strong need was felt by her to supplement the family income. As she is not highly educated, she was worried whether she will be able to fulfil her aim. She has good contacts with neighbourhood women who are engaged in different entrepreneurial activities.

She got inspired by those women to venture into a business. But she didn't want to imitate them by starting the same activities in which they were involved. So, she started exploring different business opportunities. At this point one of her friends gave her information about training in leather chappals making. She underwent 6 months training in chappals making as she was very interested in the activity. She wanted to be innovative in the selection of her business idea. After completion of the training, she waited for 2 months. The strong desire to start the unit immediately, lead her to avail credit from private banks at low interest and start the unit with an initial investment of Rs.2,00,000/-. To get loan from the bank, she made several visits to the bank and convinced them. She made efforts to know about the schemes which provide finance. She expressed her satisfaction for the support she got from bankers and other officials. Padmavathi decided to start the unit as she was confident and had full support of her husband and friends. At every stage she discussed her ideas with her husband. She didn't employ any worker but she gathered 15 women and formed them as a group and trained them in the activity. With the help of this group she managed the business. She paid them piece rate i.e. for each pair of chappals.

Padmavathi was involved in the main activities of the unit such as purchase of raw material, quality control of the products and sales. She supplies the chappals produced by her team to the wholesale shops in Renigunta road. Apart from this technique of sales she thought of employing a person to sell the products. After one year of start-up, she employed a person to help her in sales by approaching some institutes. Her marketing techniques improved her sales beyond her expectations. At present she is working to meet the demand of the market. At the end of the day with the leftover raw material she is creatively making key chains. After five years of

experience, presently she is getting Rs.50,000/- per month as profit. She is happy for her earnings but she has a desire to earn more amount.

Future plans

She has plans to start another branch in Chittoor town in future. She has plans to start production of leather bags, shoes also. She is in search of a proper working place for expansion of her unit and she is confident that she can start within a short span of period.

Impact

After starting the enterprise Padmavathi became confident of her productive skills. Padmavathi improved her status of living from a thatched house to a pucca building. Through her unit, she not only improved the income of the family but also acquired a special status in the society.

Case analysis

Though Padmavathi is not a very educated woman, her self confidence, interest and need combined with husband's support and peer group influence encouraged her to initiate the venture. She approached and convinced the bankers in getting loan. She was innovative in selecting a business idea other than what her friends and neighbours are engaged. Hard work, good production and management skills combined with cooperation of her husband and group members lead her towards success. She is creative in chappal making and in marketing. Though she started the venture with an aim to supplement the family income, she is able to earn more than enough and she is also saving for the future. She has plans to expand and diversify the business investing her savings.

Padmavathi fulfilled her desire of becoming her own boss and she has a feeling of achievement. She is a member of the mahila club and other business organisations. After starting the business, Padmavathi's economic and social status of herself and her family has improved.

Small Scale Enterprises

Case study 3 - Slim World (Service Sector)

Socio - economic - demographic profile

Mamatha is a resident of Tirupati town. She is a 52 years old married woman blessed with one girl child 21 years old, who is studying medicine at Chennai. Her father and brother had their own business. Her mother is a housewife. Her husband is TTD special class contractor. She was brought up in a joint family, but now she is in a nuclear family. She is a Post graduate and worked as Assistant professor and she resigned her job to become an entrepreneur. She also worked as Sarpanchat Muthyalareddypalle. She got a diploma in cosmetology before starting her parlour.

Business Idea Conception and Entrepreneurial Productivity

Mamatha started her beauty parlour 18 years back. She had the idea of doing something on her own even before her marriage. But she didn't put her idea into action as she was still continuing her studies. As soon as she finished her college, she got married and joined as faculty member in the university.

In the university she attended a one month EDP organised by Canadian International Development Agency and was motivated by the programme to be her own boss. She discussed about her idea of starting business with her husband and family members, when she got acceptance from them she decided to leave her job and started identifying the opportunities. At that point of time there was a great demand for beauty parlours and slimming centres.S But she was disappointed after knowing that she stepped into fully orthodox family. Her in laws were against her ideas. Though she was disappointed, she didn't give up her ideas but waited for an appropriate time. According to her, she was lucky to some extent as her husband was favourable to her ideas. At that time one of the cousins used to stay at Hyderabad. Mamatha went to Hyderabad along with her husband to see her cousin. There, she was attracted and impressed by the beauty parlour, situated next to her cousin's house. She wanted to be trained as a beautician. As her husband was in her line of thinking, he left her at Hyderabad for undergoing training. When Mamatha returned home after her successful completion of 6 months beautician course, she received many scoldings from her in laws, but she didn't care as her husband was in favour of her idea. But she was not daring enough to start the beauty parlour. After one year they lived in a separate house and not with her in laws. She recognized the people's health consciousness and decided to start "slim world" which will take care of beauty and wellness. She had equipped her enterprise with latest equipment, air conditioners and good interiors etc.

She started her parlour with just Rs.10,00,000/- as a starting capital. This amount was provided by her husband. Her parlour was the best parlour in Tirupati town. So, at the start up itself she had high demand and she is maintaining her demand till now by offering quality services. She has full and continuous support and encouragement from her husband. She is enjoying full freedom over her income and takes independent decisions on how to spend it.

Mamatha did not face any serious business problems but she had to face family problems (from in laws) which she confronted boldly. Her enterprise flourished over a period of time. She opened branches in Tirupati, Chittoor and Madanapalle. In order to update her business knowledge she regularly attends various seminars and workshops and introduces new techniques accordingly. This has brought good will to her business. She didn't face any problem in getting loan through State Finance Corporation. She got "Best Woman Entrepreneur" award and also "Woman of Success" award.

Future plans

In future Mamatha wishes to develop her business not to earn more money but to achieve something great.

Impact

Through beauty parlour Mamatha enjoys good status in the family and a special identity in society. Many young girls of her community admire her and she is role model for them. She feels proud of her status.

Case analysis

Mamatha entered into the field of entrepreneurship to fulfil her inner desire to be her own boss and to lead an independent life. Her strong desire and confidence combined with husband support helped her achieve success and satisfaction in her business. She acquired skills to manage her enterprise, this has helped to build her confidence.

Mamatha not only created self employment for herself but also provided employment to others through her venture. Business showed very positive impact on her personal, social and economic life.

Case study 4 - Ajantha Foot Wear (Production Sector)

Socio - economic demographic profile

Vijaya, aged 54 years, is a successful entrepreneur with her talent to do business in shoe making. She resides in YasodhaNagar, T.K. Street, Tirupathi. She belongs to a high social class and had studied up to 10^{th} standard. However she didn't hesitate to jump into the business to prove herself.

Her husband was a lecturer in S.V University, later he rose to the position of the principal and after his retirement he also found a place in his wife business. She has three sons. Two of them are settled in the same business. She has a strong family support in starting and running the enterprise.

Business Idea Conception and Entrepreneurial Productivity

After her marriage she didn't limit herself to the role of home maker. She had good surroundings of positive thinking people and her friends were active in different activities. She herself was a dynamic person. She was encouraged by her husband, friends and relatives to do something. She wanted to spend her time productively.

She and her husband tried to explore various opportunities and after consultation with many people they established a business in shoe making with all available resources. With the strong support of family, she established a shoe making company at Avilala, a village adjacent to Tirupathi, with a capital of 25 lakhs, well equipped machinery, own building and work force with 20 people. She took financial assistance initially from State Financial Corporation. In the beginning she faced difficulty in approaching the officials for financial assistance and dealing with dealers for raw material. But her husband stood by her side all times and made her do things on her own. Initially she faced problems in marketing products and to maintain quality, in cutting of the leather and stitching of shoes. She should have knowledge of everything. So, she went to cobbler and learnt how to stitch chappals. Her efforts to gain more knowledge gave her confidence and it helped her to maintain quality and market her products.

After some successful years in her enterprise she came to the point of 10-25crore worth production per annum. Her husband joined her after his retirement and her two sons were also there with her with their high education and managerial capabilities to maintain their business.

In 2009 she started another shoe making industry in Tamilnadu. Her sons are taking care of marketing.

In the beginning the productivity was little and gradually it reached to a high level. She never felt it's hard to face challenges in running the enterprise due to her own support systems.

Her market is extended to all towns and mandal quarters of Chittoor. Even Tamilnadu has now become a part in her market. From 1987 onwards she has been striving to be a successful woman and thus she proved herself. In her journey as entrepreneur she attained good contacts and social status.

Future plans

Now she has plans to extend her products to all types of leather articles. For her products to reach farther areas, she wants to establish branches in all district headquarters and Karnataka state also. To inculcate new technical skills, she is encouraging her workers and managers to undergo training. She wants to start a "day care centre" for the welfare of women employees.

Case analysis

Driven by passion and good surroundings, Vijaya's story stands as a good example to the amateurs. Her life is fully equipped but she did not confine herself to the four walls. She wanted to prove herself. Her dynamic nature led her to the unbeatable ends. Her family background, her social status and education helped her to elevate herself. The fire within her made her explore the opportunities and she started in little numbers. From the beginning she didn't hesitate about anything. She got help from all means and actually she utilized them in a fruitful manner.

Actually this is a story of a passionate woman who has with sufficient resources and family support. She is a woman with economic and social satisfaction.

CONCLUSION

In-depth analysis of these case studies of women entrepreneurs revealed that the entrepreneur has the power to drive changes in the structure of a society. Women entrepreneurs are changing the face of the entrepreneurship field by entering a predominantly male sector. The case studies proved that women entrepreneurs are filling the gap left by dwindling skills and technical expertise by taking up careers in varied enterprises like education, cosmetology, food sector etc. Need for achievement and accomplishment of a goal to support their families is important to women entrepreneurs in the present study. Under support groups the case studies evidently showed that spouse, family, friends and support systems helped them to start, establish and manage enterprises. Women with varied literacy levels not only improved their skills but also empowered themselves by establishing good networks and attending training programmes and workshops.

In the present study all women entrepreneurs demonstrated personal achievement of goals and share pride in what they are doing. They believed in their strength in dealing challenges and

they do not want to rest on their laurels. They have dared to move into expansion of their enterprises.

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CONSUMER ACCEPTANCE OF TRADITIONAL JEWELLERY MOTIFS OF ASSAM (INDIA), OVER ERI SILK BY INNOVATIVE TECHNIQUES

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ABSTRACT

Assam, the gateway to the Northeast India is mainly known for its exquisite silks, the art and craft. The state has a rich collection of traditional jewellery which is unique and exclusive to the state. These jewelleries hold a special place in the heart of the Assamese women. Similarly, handloom industry of Assam is basically silk oriented. Among the wild silk, Eri silk fabric has remained as "the poor man's silk" but it is closely attached to the Assamese society. The development in traditional textile is as essential as in other fields. Indian culture and its rich heritage are reflected in textiles and the traditional motifs of various regions of the country. In view of the changing market trends, fashion and consumer demands, Silk is emerging as a fashion fabric both in India and abroad. In case of Eri silk fabric it has limited use in clothing and accessories. Hence the restructured and redesigned traditional jewellery motifs of Assam over Eri silk products will have a greater potential in reviving the decline art, generate revenue, self-employment of craftsmen and also recognition of the art.

Keywords: Handloom industry of Assam, Eri silk, traditional jewellery, hand embroidery,

INTRODUCTION

The information incorporated in the paper is primary and the data have been collected by purposive sampling method. This work of art was expressed on Eri silk fabric in the form of traditional hand embroidery as it is closely connected with the era of the individual in history of mankind and reflects the personal expression of an entity. For this study, selected traditional motifs of Assamese ornaments were selected. Some of the popular traditional Assamese jewellery include earrings with exquisite Lokaparo, Keru, Thuriya, Jangphai etc. An array of necklaces include Golpata, Satsori, Jon biri, Bena, Gejera, Dhol biri, Doog doogi, Biri Moni, Mukuta Moni, Poalmoni, Silikha Moni and Magardana. And diversified rings include Senpata, Horinsakua, Jethinejia, bakharpata and others. Five motifs each from necklace, earring bangle and finger ring designs were chosen. Selected motifs were further developed into 3 categories- the border, the main motif and all over butti followed by placement of developed patterns on products. Products developed were stoles, scarfs, mekhela-chador (ladies traditional attire of Assam) for Assamese women and handkerchief, jackets for men. The developed products were surveyed by selected respondents.

The main objectives of the present study (1)* To examine the selected performance properties of Eri silk fabric, (2)* To investigate the possibility of modifying motifs of traditional Assamese ornament over Eri silk through hand embroidery, (3)* To assess the consumer acceptance of hand embroidered traditional motifs of Assamese ornaments on Eri silk fabric and garments, (4)* To estimate the cost of hand embroidered traditional ornaments motifs on various

wearable and (5)* A comparative study on consumer acceptance between non-Assamese and Assamese women residing in Bhopal city towards developed Eri silk fabric and apparel.
The present study was undertaken to explore the possibility of restructuring and redesigning the traditional jewellery motifs of Assam over Eri silk by traditional hand embroidery.

REVIEW OF LITERATURE

- Mahapatra (2004) reported the process carried out for degumming of silk in places like Bangalore, Malda, Kolkata and Banaras along with the percentage of impurities present in the raw material found in those places. The author mainly emphasized on the mechanical and chemical processes followed by the places which was taken from Italian technology.
- In 2005, Sreenivasa and coworkers made an attempt to develop two varieties of Eri silk and polyester blended yarn on short staple spinning system to diversify the Eri silk. The work was carried out for the development of the process to cut the Eri fibres of required length from the Eri cocoons. The Eri fibres were blended with polyester in 50:50 and 30:50 blend ratios and to develop a suitable process parameter for yarn on short staple spinning system. The developed yarns were tested for physical properties and comparisons were made on the performance of different blend ratio.
- Prasong S. (2009) et.al. investigated and compared some characteristics of Bombyx mori and Eri (Phillosamia racini)silk in different forms, with and without sericin. The authors measured the protein contents and found out the composition of the silk fibroin and sericin proteins by Lowry method. The authors determined the secondary structure and thermal behavior by FT-IR and TA instrument respectively. Also the authors reported the Bombyx mori composed of more amount of sericin content than that of Eri silk.
- In 2012, Itagi A. & Basu A. reported Drape as a unique property that allows a fabric to be bent in more than one direction describing a sense of graceful appearance. Silk fabrics world over are known for their unique functional and aesthetic properties. Sewing is an important step in converting pieces of fabrics into a garment. Fabric drape is more realistically investigated by considering seams.
- In 2009, Angelika, in her article discusses the traditional dresses and ornaments of the Ahoms of Assam. Assam was originally ruled by the Ahoms. The author reported that for every class of people particular dresses and jewelries were been assigned and therefore it was through the appearance of a person only one could be identified without any difficulty. The dresses that were worn by the kings or by the higher officials of the Ahom kingdom were not worn by the subordinates. The author reported that the higher officials, queens, princesses and the King used to drape turbans made of silk (pat-muga) in their head. Certain attires that were quite widely used and worn by the higher officials and also by some classes of the subordinates are 'Riha' (a kind of cloth draped around the body and the shoulder), 'Mekhela' (a wrapper kind of cloth worn in the waist) and 'Sula –Suria' (a kind of short shirts and clothes made of Assam silks like Golden Muga, White Pat and Eri Silk) etc.
- In 2013, Padaki N.V. et al. reported traditional Assamese textiles are uniquely distinguished among the Indian traditional textiles. Many urban, rural and tribal people of Assam profoundly used the ethnic dresses for many occasions even today. Although much influence on technology front, design and colour has been witnessed over the years, still the charm of

traditional textile designs can be distinctively seen in these traditional costumes of the Assam state.

- In 2008, Naik S.D, et.al. reported that the handloom Industry in highly labour oriented, having legacy of unrivalled craftsmanship. Handloom goods are no longer the choice of poor alone, but a weakness for the elite in India and abroad.
- Anshu Singh Choudhary (2015), documented that cost analysis in garment Manufacturing, as the topic implies, deals with the work of costing a garment which involves the expenses for fabric, trims, cuttings, labor, overhead, sales commission, manufacturer's profit & transportation. The production cost of the garment must be determined in order to set the wholesale price, the price that retailers' pay for goods that they purchase from manufacturers. There are two types of costing. The first one is pre-cost. Pre-cost is the estimate of the garment before it is adopted into the line. The designs must keep the fabric, trim and the labor cost for each garment within the limit set by the company for a particular line price range.
- In 2012, Rajput N. et al made an attempt to examine Indian female consumers buying behavior and deeply understand the key factors of branded clothing that influence female consumer's involvement towards stylish branded clothing. Also the authors emphasized on complete awareness of the branded apparels amongst females and their shopping behavior reflected that they purchase these products occasionally. Females have particular perspectives and motives behind this purpose. The culture is shifting towards buying from the malls because of shopping experience the consumer get and also family and friends followed by internet and advertisement. The authors from this study also observed that price, fitting, income level of consumers is significant factors and some factors to be insignificant like status, durability and celebrity endorsement.
- In 2013, Kumar S. et.al. in their study emphasized about buying behaviour of women customer's towards jewellery products with special reference to Tirupur city. The authors reported some of the customers are not serious in their responses to the survey and as a result there are some difficulties in reaching to the right conclusion. Lastly the authors concluded the results may help the management of Jewellery retail stores to understand about the factors that influence the satisfaction of customers towards retail stores.

HYPOTHESES

1) There will be no significant difference between a degummed Eri silk fabric and Eri silk fabric in raw state.
2) There is no possibility of modifying motifs of traditional Assamese ornaments over Eri silk through hand embroidery.
3) The hand embroidered pattern does not have significant resemblance of the original motifs of Assamese ornaments.
4) There is no significant relationship between non-Assamese females and Assamese females in their acceptance towards developed Eri silk fabrics and wearable's.

METHODOLOGY

Material – fabric: Plain weave Eri silk fabric and Eri silk stoles were woven at Fabric Plus (weaving unit), Guwahati, Assam. The Eri fabric weaving was carried out using two different

natural shades (brownish and off-white) of Eri silk yarn. The wild silk Eri possesses a natural stiffness due to the presence of wax etc. Therefore, it was necessary to carry out some pre-treatment like thorough scouring to reduce the original stiffness of the fabric due to presence of sericin, wax etc. Further the fabric was tested for its constructional parameters in control and scoured state.

Traditional jewelry motif: Assam has a rich collection of traditional jewelry. Ornaments of Assam are unique and exclusive to the state. In Assam, jewelry is most influenced by nature (example: birds, grains, animals etc.) and others by musical instruments (example: dhol, pepa etc.) and few more by things daily used in an Assamese household (example: japi – a handmade head gear). In this study the investigation of traditional jewelry motifs of Assam was based on the above-mentioned influences.

Art material: A4 size drawing sheets, HB shades lead pencils, eraser, ruler, butter paper, compass and Staedtler pencil.

Embroidery material: Golden metallic threads, coloured silk threads (green, black, red, blue), beads (shiny off-white) kundan (red, green, blue), embroidery wooden frame, aari embroidery needle.

The Research design used for present study has two-edged approach. An experimental with descriptive survey was used to acquire the information. In the present study, combination of qualitative and quantitative data was reported by the particular Assamese women and non-Assamese women respondents from which the data had been assembled. The quantitative data had been reported using percentages and frequencies. Combining the two sets of data had been useful in validating findings, enhancing and testing emerging theories that makes comparison between responses and develop coherent theoretical representation of findings based on reasoning.

The methodology adopted in the study are, pre-treatment, testing various constructional and performance properties of the selected Eri silk fabric, investigation and selection of traditional ornamental motifs, application of innovative techniques over the predefined motifs, development of wearable's and its consumer acceptability. As the strength, drapability, durability and quality of the fabric is the basic consideration of a consumer before purchasing a garment, however the performance properties testing was carried out of the Eri silk fabric both in controlled as well as scoured state. Further the selected motifs were redesigned, restructured and embellished using hand embroidery (aari, kundan and bead work) which was then constructed into wearables followed by costing of the developed products. The study was based on the variables that were decided as per the objectives of the study. The dependent variables were for developed wearable's constructed after application of innovative techniques on selected traditional ornamental motifs of Assam. Keeping in view the problem of the study, assamese and non-assamese women residing in Bhopal city were selected as a sample of the present investigation. Further the collected data was analysed with suitable statistical technique. The comparison was made on the basis of frequencies and percentage, range technique was used for classification of respondents, Arithmetic Mean (X): The arithmetic mean was calculated by using the formula – $X=Xi/N$ and applying two independent sample "t" test was carried out for comparing between two groups.

RESULT AND DISCUSSION

The data was collected by the experimental and survey method. Results of various physical tests performed on control and scoured are illustrated below –

Table 1: Average Values of Results of Constructional Parameters of Eri Silk Fabric

Fabric particular	Direction	Avg. Fabric count (threads/inch)	Linear density (tex)	Fabric weight (GSM)
Eri silk control state	Warp	35	54	178
	Weft	41	60	
Eri silk scoured-bleached	Warp	37	34	164
	Weft	50	40	

From the above values of (Table.I), it was observed that the values of warp and weft threads per inch have increased after scouring and bleaching. The increase is due to the relaxation and swelling of the yarns. Similarly, after bleaching, the yarn has become finer, which is due to removal of gum (sericin), impurities and surface finishes. The fabric weight has reduced to 164g after bleaching which is also due to the removal of surface finish, gum and impurities.

The Eri silk fabric wearables embellished with traditional jewellery motifs of Assam were evaluated for their acceptability among 50 Assamese women (residing in Bhopal) and 50 non assamese woman (regular clients of Boutiques in Bhopal).

Product (SKU)	(JAS1) Scarf	(LOJE2) Jacket	(JOJ3)jacket
Developed products			

Product (SKU)	(DOPS4) Pocket square	(JEK5)Top	(JEPS6) Pocket square
Developed products			

Fig 1: Developed wearables with restructured design placements, embellishment and construction.

From the above figures it shows the developed products are bandh gala jackets for men, pocket squares, mid length women kurta and sador. The surface embellishment was of aari work, beadwork and kundan over the selected traditional ornamental motifs of Assam. The motifs used on the products are- dugdugi, lokaparo, jethipota, joonbiri, japi and thuriya. From the collected data and further to its analysis it was observed that the developed products were very well appreciated and accepted by the respondents.

Table 2: Acceptability index of wearables developed from embellished traditional jewellery motifs of Assam by Assamese women (n=50)

Product SKU	Size of the Motif	Placement of the Motif	Colour Combination	Overall Appearance	Total	Mean Score	Acceptability Index(%)
(JAS1) Scarf	202	205	205	209	821	16.42	82.1
(LOJE2) Jacket	209	209	219	209	846	16.92	84.6
(JOJ3)jacket	211	207	211	215	844	16.88	84.4
(DOM4) Pocketsq.	204	203	212	210	829	16.58	82.9
(JEK5) Top	180	181	182	187	730	14.6	73
(JEPS6)	202	201	210	213	826	16.23	82.6

Table 3: Acceptability index of wearables developed from embellished traditional jewellery motifs of Assam by non-Assamese women (n=50)

Product SKU	Size of the Motif	Placement of the Motif	Color Combination	Overall Appearance	Total	Mean Score	Acceptability Index(%)
(JAS1) Scarf	164	188	167	187	706	14.12	70.6
(LOJE2) Jacket	188	190	156	153	687	13.74	68.7
(JOJ3) Jacket	173	171	163	158	665	13.3	66.5
(DOM4) Pocket sq.	177	183	155	165	680	13.6	68
(JEK5)Top	183	190	193	187	753	15.06	75.3
(JEPS6) Pocket sq.	179	187	160	170	696	14.3	69.6

CONCLUSION

The art and craft of Assam are world famous for unique traditional methods of production and for tribal out forms. Weaving in Assam is characterized by its distinctiveness, and although most of the products are for purely utility purpose, some of them which are used for certain occasions are of exquisite beauty, durable quality, delicate weave, dainty design and delightful colours. From early times, Eri cloth has been serving the purpose of Woolens particularly amongst the less affluent section of the Assamese people. Attempts have recently been made to blend or bleach and dye Eri silk fabrics. Because of the uneven yarns, there has always been the difficulty of uniform colouration. Today with the advent of technology, many companies spin eri spun silk as fine as Nm 210, that enables to broaden the application range to a multiple dimension. Eri silk is now used as one of the most sustainable, low impact, high social impact fibre to produce fabrics suitable for the finest sarees, mekhla-chaddar, fashion accessories (stoles) as well as home furnishings. The present study attempt will be made on revival of traditional Assamese ornaments motifs on eri silk fabric through selected hand embroidery. The concept of combining this eri silk fabric with traditional design of assamese ornaments motifs may open avenues for sustainable, eco-friendly fashion development. This work of art will be expressed on eri silk fabric in the form of hand embroidery. The development of the art of embroidery is closely connected with the era of the individual in history of mankind and reflects the personal expression of an entity. Hence the embroidered Eri silk fabric would have greater potential in local (Assam) as well as in export market.

From the present study it can be observed that the embellished traditional jewellery motifs resulted in fresh and colourful pattern on developed Eri silk products. Considering all 5 attributes it was found that code (LOJE2) Jacket was highly accepted by Assamese women respondents (84.6%) with a total score of 84.6% out of 1000 followed by (JOJ3) jacket with score 84.4%. Whereas code (JEK5)Top was highly accepted by the non assamese respondents with a score of 75.3%. Moreover

the motifs which were gradually fading among the community itself showed a very good recognition towards art. The embroidered Eri silk fabric also created a huge change in a positive way among craftsman.

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DIETARY PATTERNS AND NUTRITIONAL STATUS OF WOMEN OF REPRODUCTIVE AGE IN RURAL AREAS OF MUZAFFARPUR DISTRICT IN BIHAR

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ABSTRACT

***Objective*:** The objective of this study is to know the socio-demographic features of women of reproductive age, record the food and nutrient intake of the respondents and compare the same with the available recommended dietary allowances (RDA) and assess the nutritional status of the women.
Methods-It was a cross sectional study carried out in rural areas of Muzaffarpur district, Bihar. Women in the age group of 18-35 years were selected for the study. Three hundred twenty one women were selected randomly for the study. Food consumption of the subjects was assessed using a 24-hour dietary recall method. Anthropometry (Height & Weight) for calculating the Body Mass Index and comparing with standards.
Results-It was evident that women's diets were largely deficient in macronutrients and micronutrients, with the mean intake of energy and protein being 1500kcals/d and 19.6 g/d respectively. The average food intake of rural women was less than Recommended Dietary Allowances (RDA).Chronic Energy Deficiency Grade of women shows that 43 per cent was Normal , 36.1 per cent having Mild Energy deficiency/Underweight (Grade I) followed by 19.3 per cent Moderate Energy deficiency/Underweight (GradeII) and 1.2 per cent having Severe Energy deficiency/Underweight (Grade III).**Conclusion-**Majority of the women in Bihar are at risk of delivering low birth weight babies and have pregnancy complications.. Hence there is a need to provide special attention to this group in improving their nutritional status by intervening appropriate health and nutrition programmes .

Key Words: Nutrition, Nutritional status, BMI, Average food intake, RDA

INTRODUCTION

Dietary intake pattern plays a significant role in human health. In addition, reproductive biology, poverty, lack of education, socio-cultural traditions and disparities in household contribute to under_nutrition in women. Those women who consume limited animal source foods, fruits and vegetables, increase their risk of micronutrient deficiencies. Women on low protein and carbohydrate diets can be severely malnourished mothers and are at increased risk of child mortality. It is difficult to measure exactly what proportions of losses are due to maternal malnutrition, but recent research shows that 60% of deaths of under-five children are associated with malnutrition and children's malnutrition is strongly correlated with mothers' poor nutritional status (Pelletier &Frongillo, 2003).

Maternal malnutrition increases the risk of poor pregnancy outcomes including obstructed labour, premature or low-birth-weight babies, postpartum hemorrhage and increased risk of

mortality. It not only affects woman's health but also the health of the child. Children of such mothers are more likely to face cognitive impairments, growth failure, lower resistance to infections, and a higher risk of diseases and death. As per the recent figures of NFHS-4 (2015-16), the percentage of women aged between 15-49 years whose Body Mass Index is below normal (18.5 kg/m2) hovers around 30.4% (69 Lakh). Despite a decline of 15 percent point from NFHS-3 (2005-06), still a large number of women in this age group remain undernourished. Despite wide coverage of ICDS services, the uptake of the same seems limited, as per Rapid Survey on Children, 2013-14 (MoWCD, GoI), only a small proportion of pregnant women (21.7%) and lactating mothers (39.3%) availed supplementary food from AWC.

NFHS-4 (2015-16) indicates that the number of women and children suffering from Anemia has slightly come down from NFHS-3 (2005-06), however the scourge of Anemia still remains largely the same because of the slow pace of change. More than half of the population of women age 15-49 years and children age 6-59 months are Anemic in the state. As per Rapid Survey on Children, 2013-14 (MoWCD, GoI), the state average of women who consumed 100 or more IFA tablets/ syrups during pregnancy is as low as 14%. Increasing awareness on maternal and child health is crucial in order to increase the demand. Improving supply of IFA tablets/ syrups in strategically selected locations would be important in order to deal with the issue. Anemia among women is one of the major reasons of maternal deaths and makes women vulnerable to give birth to low-weight babies, which eventually leads to stunting among children.

Poor maternal nutritional status of woman before and during pregnancy such as short maternal stature due to mother's own childhood undernutrition, low BMI at conception and inadequate gestational weight gain due to poor dietary intake has serious implications on birth outcome (UNICEF, 2013). Socioeconomic status affects a set of proximate determinants of health that directly affect the health and nutritional outcomes of children. Undernourished girls have greater likelihood of becoming undernourished mothers who have a greater chance of giving birth to malnourished children (Ozaltin et. al, 2010).The association between poverty and under nutrition is a manifestation of the somatic development pattern of children who live in poorer conditions with insufficient food intake, greater exposer to infections, and lack of access to basic health services (Judson, 2004).

Objective:

The objective of this study is to know the socio-demographic features of sample respondents, record the food and nutrient intake of the respondents and compare the same with the available recommended dietary allowances (RDA) and Nutritional status of the women falling in reproductive age group.

METHODS

It was a cross sectional study carried out in rural areas of Muzaffarpur District, Bihar. All the women in the age group of 18-35 years (reproductive age group) were selected for the study. Three hundred twenty one women were selected randomly for the study. Information on socio-economic conditions, dietary intake, food habits and knowledge about the food was obtained with interview schedule. Food consumption of the subjects was assessed using a 24-hour dietary recall method.

- **Anthropometry** (Height & Weight) for calculating the Body Mass Index and comparing with standards. It is a measure of relative body fitness and can be computed by using weight (kgs) ;(minimal clothing) and height (meters) ;(without shoes).

BMI= Weight (kg)/Height (m^2)

Table 1: FAO/ WHO Classification for chronic Energy Deficiency/or Underweight

Chronic Energy Deficiency Grade (FAO)	Underweight Grade (WHO)	BMI(Kg/m2)
Normal	Normal	>18.5
Grade I	Mild Underweight	17.0 -18.4
Grade II	Moderate Underweight	16.0 -16.9
Grade III	Severe Underweight	<16.0

RESULTS

The present study showed that 46.1 per cent of the respondents belonged to low income group. A little more than half of the families 51.4 per cent had medium size family followed by 32.7 per cent and 15.9per cent had large and small size family respectively. A little more than half 56.7 per cent of women had knowledge about additional diet during pregnancy which increases birth weight but due to low income level they do not increase the nutritional requirements through the right food items. It was evident that reproductive women diets were largely deficient in macronutrients and micronutrients, with the mean intake of energy and protein being 1500kcals/d and 19.6 g/d respectively. The average food intake of rural women was less than Recommended Dietary Allowances (RDA).The intake of cereals and millets was 35.3% more than their respective RDA. Roots and tubers intake was double than their respective RDA. Women take 43.5 per cent less amounts of green leafy vegetables. The intake of other vegetables and fruits was 48.7 per cent less than the RDA. A substantial proportion of the women did not drink milk as per their respective RDA. The largest proportion of energy 77 per cent was obtained from carbohydrates, followed by fat (10%) and protein (13 %). Mean intake of iron rich foods was half of the RDA due to lack of knowledge on iron rich foods.

Table 2: Socio-economic variables & Knowledge and Some Practices of Women about Nutrition

Sr. no.	Variables	Frequency	Percentage
1	Family Income(Rs/month)		
	< 5000	85	26.5
	5000-10000	148	46.1
	10000-20000	52	16.2
	>20000	36	11.2
2.	Size of family		

	<4	51	15.9
	5-10	165	51.4
	>10	105	32.7
3.	Women Education		
	Illiterate	151	47
	Below upper primary	101	31.5
	Above upper primary	69	21.5
4.	Daily Expenditure on Food (Rs/day)		
	< 50	162	50.5
	51-150	121	37.7
	>150	38	11.8
5.	Additional diet during pregnancy increases birth weight		
	Agree	182	56.7
	Disagree	65	20.3
	Don't know	74	23
6.	Knowledge about the iron rich food		
	Yes	62	19.3
	No	259	80.7

TABLE 3: Malnutrition (Chronic Energy Deficiency) in women of Reproductive Age

ChronicEnergy Deficiency (CED)	**BMI kg/m2**	**Total (%)**
Normal	**Normal (> 18.5)**	**138 (43)**
Grade I	**Mild Underweight (17.0 -18.4)**	**117 (36.5)**
Grade II	**Moderate Underweight (16.0 -16.9)**	**62 (19.3)**
Grade III	**Severe Underweight (<16.0)**	**4 (1.2)**
	Total	**321 (100)**

Chronic Energy Deficiency Grade of women shows that 43 per cent were normal , 36.5 per cent had Mild Energy deficiency/Underweight (Grade I) followed by 19.3 per cent Moderate Energy deficiency/Underweight (GradeII) and 1.2 per cent having Severe Energy deficiency/Underweight (Grade III).

CONCLUSION

Maternal undernutrition plays a crucial role in influencing maternal, neonatal and child health outcomes (Mason et al., 2012). Nutritional status of mother was significantly associated with child nutritional status. This statement has been approved by Pelletier & Frongillo in 2003

that children's malnutrition is strongly correlated with mothers' poor nutritional status. The dietary intake patterns to combat nutritional deficiencies are not appropriate and the nutritional status of women of reproductive age is still poor. A majority of women consume starchy staple food while less attention has been given to the consumption of vegetables, meat, fruits and dairy products. Cultivation of vegetables and fruits and consuming them can prove to be an important factor in maintaining better nutritional status. It is imperative that the government and non-government organizations act to improve dietary intake pattern of women in Bihar to promote women's health.
Women are more malnourished than men, because of including women\'s reproductive biology, low social status, lack of education and poverty. The Socio-cultural traditions and disparities in household work patterns can also increase women\'s chances of being malnourished. It is difficult to measure exactly what proportions of losses are due to maternal malnutrition. Thus majority of the women in Bihar are at risk of delivering low birth weight babies and have pregnancy complications. Some of the reasons for under nutrition among women could be poor diet intake, ignorance, early marriage, and high morbidity due to unhygienic practices and surroundings. Undernutrition of mothers may be carried over to their children. Hence there is a need to provide special attention to this group in improving their nutritional status by intervening through appropriate health and nutrition programmes.

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A COMPARATIVE STUDY OF WOMEN RIGHTS AWARENESS WITH THEIR WORK STATUS IN JHANSI CITY

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ABSTRACT

Women have had an eventful history in India. Women held a high position of respect in society as specified in various ancient scriptures. But gradually, because of social, economic and political changes, women lost their status. Various reformative legislations have been formed by the government from time to time, but the objectives of these reformed acts and legislations can't be fulfilled unless the woman herself is aware about her rights, whether it be Constitutional Rights or Legal Rights. Present study has been conducted on 50 women (25 working and 25 non-working) of Jhansi city to study the association between awareness of constitutional and legal rights and work status of women of Jhansi city. A self-constructed Women Rights Awareness Questionnaire was used for the present study and 'Chi-square' test was used to study the significant association between categorical variables. Results showed significant association between awareness of constitutional and legal rights and work status of women. In comparison of non-working women, working women were more aware about their constitutional and legal rights.

Keywords: Legal Rights, Constitutional Rights, Work Status

INTRODUCTION

In ancient time, especially in context of India, women held a high position of respect in the society as specified in Rig Veda and other scriptures. But gradually, because of social, economic and political changes, women lost their status and were demoted from their previously occupied position in the society. Many evil traditions and customs stepped in, which enslaved and tied women within the boundaries of the house and the situation is so bad today that the official statistics clearly demonstrate their declined sex-ratio, health status, literacy rate, rate of participation at work as well as political participation. In addition evils like domestic violence, child marriage, exploitation, dowry death, sexual harassment, kidnapping, rape, molestation, etc. have increased in society not only in India but in almost every part of the world. According to historian Romila Thaper (1975), "Within Indian sub-continent there have been infinite variations in the status of women diverging according to cultural malice, family structure, class, caste, property rights and morals."[1]

Ranging from the end points of the medieval period, the various motions for the promotion of equal rights made by various reformers, women have had an eventful history in India. No doubt, today's woman is achieving a lot and is setting new milestones every day in different fields. But one can't deny the fact that there is still a long way to go. Her path is full of hurdles. Dhanoa (2012) discussed in detail the violation of women's human rights in India and gave emphasis to the

need of proper policy implementation in combating this problem.[2]The sex ratio of India clearly indicates that the Indian society is still biased against female. This is really shameful for a society which assumes itself to be highly civilized, a woman is raped every hour and in every 90 minutes a woman is burnt to death due to dowry problem. [3]The rights of women have always remained at stake.

The United Nations Fourth World Conference on Human Rights repeated clearly that the human rights of women are an integral, indivisible and inalienable part of universal human rights throughout their life cycle.[4]Number of participating countries is increasing which are working actively to establish mechanisms for enabling women to exercise their rights. Government intends to make legal and judicial system more responsive and gender sensitive to women's needs, especially in cases of domestic violence and personal assault. It not only intends to enact new and effective legislation and also reviews the existing ones to ensure quick justice and commensuration of the culprits in accordance to the severity of the offence. The government policies aim to encourage positive changes in personal laws related to marriage, maintenance and guardianship, divorce, etc. with the full participation of all stakeholders including religious leaders and the community so as to eliminate all sort of discrimination against women. Existing property rights in a male-controlled system has led to subordinate status of women. The government policy aims to encourage changes in laws relating to inheritance and ownership of property by evolving consensus in order to make them gender just. But the various objectives of these reformed acts and legislations can't be fulfilled if the woman herself is not aware about her rights, whether it be constitutional rights or legal rights. So, with all this it is very important for women to be aware of their rights.

OBJECTIVES

The present study has been carried out to fulfill the following objectives:

1. To study the association between overall women right's awareness and work status of women of Jhansi city
2. To study the association between awareness of constitutional & legal rights and work status of women of Jhansi city.

METHODOLOGY

Descriptive survey method was used by the investigators to collect the relevant information for research. Descriptive statistics was employed to describe the main features of collection of data in quantitative terms.[5]

Sample

A sample of 50 women (25 Working and 25 Non-Working) was purposively selected from Jhansi.

Tools used

A self-constructed Women Rights Awareness Questionnaire was used for present study.

Statistical technique

'Chi-square' test was used to study the significant association between categorical variables.

RESULTS AND DISCUSSION

Table 1: Association of women rights, awareness along with their work status

WORK STATUS OF RESPONDENTS	WOMEN RIGHTS AWARENESS				TOTAL
	SLIGHTLY AWARE	SOMEWHAT AWARE	MODERATELY AWARE	EXTREMELY AWARE	
WORKING	0(0)	0(0)	7(14)	18(36)	25(50)
NON-WORKING	2(4)	8(16)	7(14)	8(16)	25(50)
TOTAL	2(4)	8(16)	14(28)	26(52)	50(100)
χ^2=.003, df- 3, P<0.05			Figure in parentheses indicates percentage		

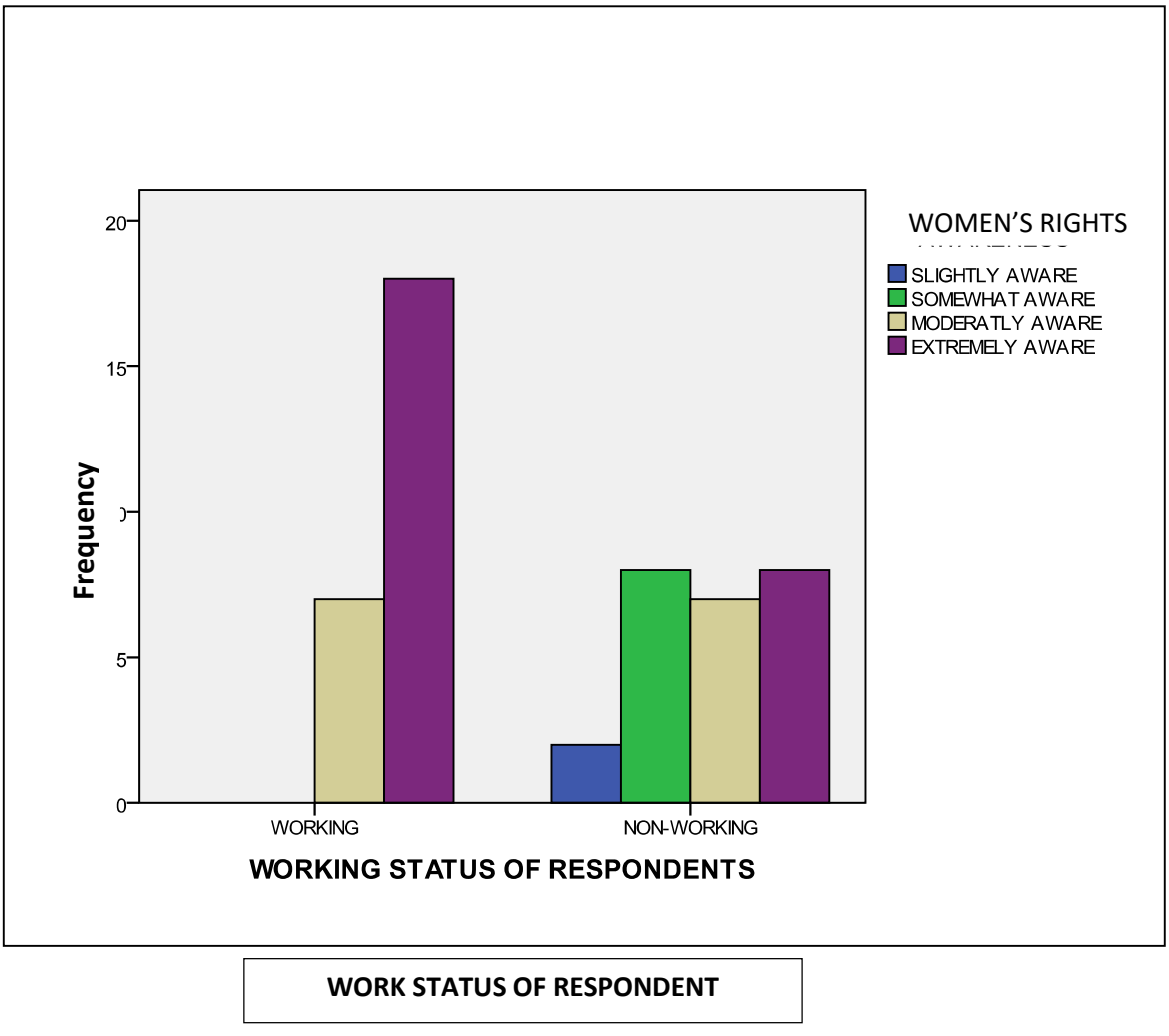

Fig 1: Association of women rights awareness along with their work status

Table 1. Portrays the association of women rights awareness along with their work status. The data highlights that respondents of both work status were extremely aware regarding women rights (working 36% & non-working 16%). The table also depicts that similar percentage (16%) of respondents were also somewhat aware about their rights. Statistically

highly significant association was observed between women rights awareness and work status of women (χ^2= **.003**). Similar study has been conducted by Das R. (2015) in Khokrajhar town. Results showed that highly educated working women were found to have more awareness and understanding of the condition, sense of self- worth than the non-working women with low level of education.

Table 2: Association of women constitutional rights awareness along with their work status

WORK STATUS OF RESPONDENT	WOMEN CONSTITUTIONAL RIGHTS AWARENESS				TOTAL
	SLIGHTLY AWARE	SOMEWHAT AWARE	MODERATELY AWARE	EXTREMELY AWARE	
WORKING	0(0)	0(0)	5(10)	20(40)	25(50)
NON-WORKING	3(6)	6(12)	8(16)	8(16)	25(50)
TOTAL	3(6)	6(12)	13(26)	28(56)	50(100)
χ^2= .002, df- 3, P<0.05					
Figure in parentheses indicates percentage					

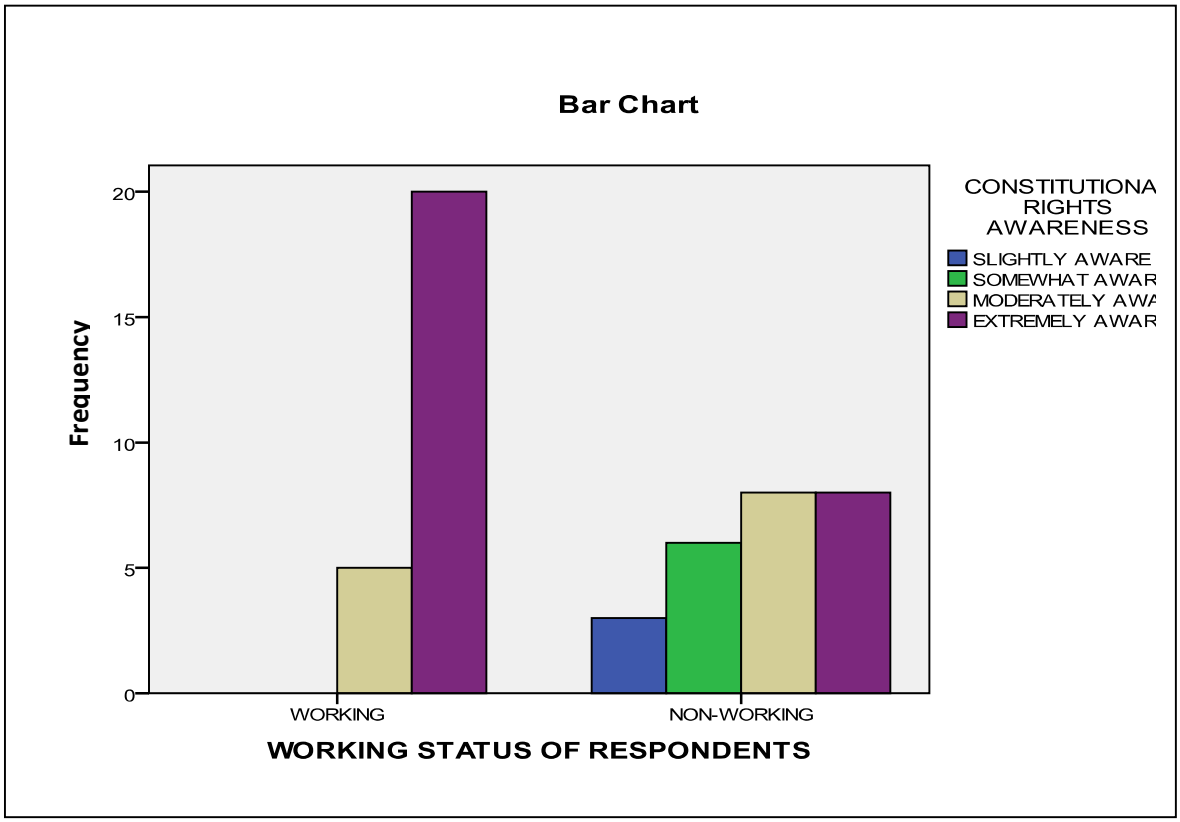

Figure 2: Association of constitutional rights awareness along with working status of women

Table 2 revealed the association of women constitutional rights awareness along with their work status. Results revealed that women who are working were extremely aware (40%) followed by moderately aware (10%). While non-working were moderately and extremely aware (16%) about their constitutional rights. Statistically highly significant association was seen between women constitutional rights awareness and work status of women (χ^2= **.002**). It means women's working status makes them more aware about their constitutional rights.

Table 3: Association of women legal rights awareness along with their work status

WORK STATUS OF RESPONDENT	WOMEN LEGAL RIGHTS AWARENESS				TOTAL
	SLIGHTLY AWARE	SOMEWHAT AWARE	MODERATELY AWARE	EXTREMELY AWARE	
WORKING	0(0)	4(8)	8(16)	13(26)	25(50)
NON-WORKING	5(10)	8(16)	6(12)	6(12)	25(50)
TOTAL	5(10)	12(24)	1(2)	19(38)	50(100)
χ^2= .027, df- 3, P<0.05					

Figure in parentheses indicates percentage

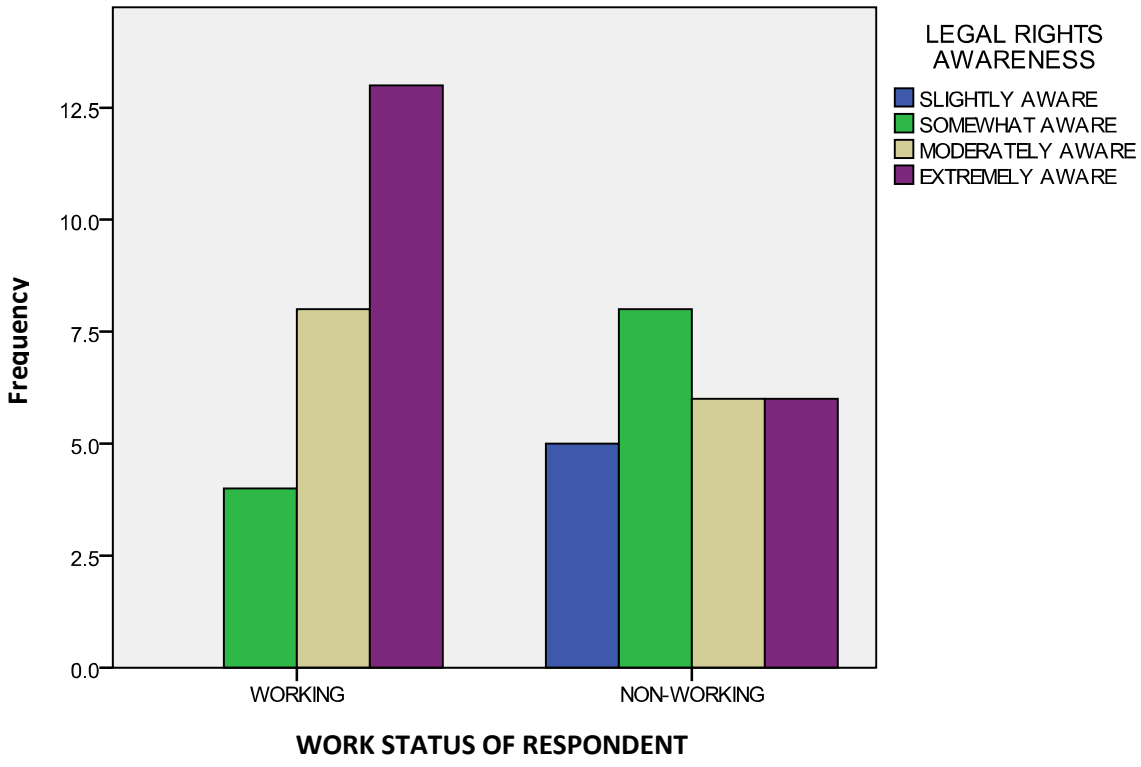

Figure **3: Association of women legal rights awareness along with their working status**

Table 3. describes the association of women's legal rights awareness along with their work status. The table further disclosed regarding women's legal rights that working women were extremely aware (26%) followed by moderately (16%) and somewhat aware (8%). While non-working women were somewhat aware (16%) about their legal rights followed by moderately and extremely aware (12%). Statistically highly significant association was seen between women's legal rights awareness and work status of women (χ^2= **.027**). Similar study was conducted by Singh et al. (2014) in Punjab. Results showed significant difference in awareness of legal rights between working and non-working women.[7]

CONCLUSION

Women empowerment can be viewed as a continuum of several interrelated and mutually reinforcing components among which awareness building is a basic one. Education is mainly responsible for making the women folk aware of their rights and opportunities. Educated women can recognize the importance of these facilities and know how to seek it for themselves. In order to promote gender equality, education can be used as one of the important means of empowering women. Conclusion drawn from the study clearly showed that in comparison of non-working women, working women were more aware about their constitutional and legal rights.

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IMPACT OF INTERVENTION PROGRAMME ON KNOWLEDGE AND ATTITUDE OF ADOLESCENT GIRLS TOWARDS SEXUALITY EDUCATION

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ABSTRACT

Sexuality education can be defined as a lifelong process of acquiring information and forming attitude, beliefs and values. It encompasses sexual development, sexual and reproductive health, interpersonal relationships, affection, intimacy, body image, and gender roles (SIECUS, 1996). Sexuality education is defined as an age appropriate, culturally relevant approach to teaching about sex and relationship by providing scientifically accurate, realistic, non-judgmental information UNESCO (2009).

Imphal city of East and West districts was selected as a study region. Five schools from east region and 3 schools from west regions were selected randomly for the intervention programme. The total sample for the study was 200 adolescent girls selected using simple random sampling technique. The questionnaire comprised of socio-economic information, Knowledge assessment consisting of 84 statements and assessed with Yes or No options. The classification of knowledge level was made as Inadequate, Moderate and Adequate. Attitude assessments consists of 62 statements of five point Likert type scale with responses as strongly agree, agree, undecided, disagree, and strongly disagree. After obtaining pre-test information, an intervention program was conducted for adolescent girls by using audio-visual aids and teaching strategies for 3 months duration. Further, post-test assessment was elicited.

Majority of the sample in the study were in the age group of 15 years, studying in 8th standard with one sibling, first ordinal position and 60-69% in academic performance. Majority were from nuclear family, urban area and their income was between Rs.20,001-30,000. Majority of respondents' fathers education were graduate and mothers had studied up to primary level. Findings indicate that pre-test knowledge was found to be 48.8 per cent as compared to post test (78.1%). The enhancement of knowledge score from pre to post test was found to be 29.3 per cent, establishing the enhancement of knowledge, which was found to be statistically significant ($t=78.18^*$, $p<0.05$). Findings indicate that pre-test attitude was found to be 48.9 per cent as compared to post test (73.0%) with an enhancement of attitude score from pre to post-test found to be 24.2per cent, which was found to be statistically significant ($t =55.20^*$, $p<0.05$). It can be concluded that there is a need to conduct orientation and effective training programme at school level to enhance the existing knowledge on sexuality education among adolescent girls.

Keywords: Adolescents, sexuality education, Intervention programme, Knowledge, Attitude

INTRODUCTION

Education in human sexuality includes not only the anatomy and physiology of the sex organs but also the secondary sex characteristics and their growth and development. It imparts knowledge about the changes that take place in the emotional make-up of the person thus determining individual responses to different life-situations. It also includes human dignity and interpersonal relationships, changing family roles, the status of women in the family and society, healthy and responsible man-woman relationships, respect for the sex partner and mutual concern in sexual relationships (Dhun Panthaki, 2005).

Sexuality education can be defined as lifelong process of acquiring information and forming attitude, beliefs and values. It encompasses sexual development, sexual and reproductive health, interpersonal relationships, affection, intimacy, body image, and gender roles (SIECUS, 1996). Sexuality education is defined as an age appropriate, culturally relevant approach to teaching about sex and relationship by providing scientifically accurate, realistic, non-judgmental information UNESCO (2009). Sexuality education provides opportunities to explore one's own values and attitude and to build decision making, communication and risk reduction skills about many aspects of sexuality.

Sexuality education is more than the instruction of children and adolescents on anatomy and the physiology of biological sex and reproduction. It covers healthy sexual development, gender identity, interpersonal relationships, affection, sexual development, intimacy, and body image for all adolescents, including adolescents with disabilities, chronic health conditions, and other special needs.

Sexuality education to the adolescents includes the process of creating an atmosphere of harmony, security to answer their questions regarding the origin of life - truthfully, simply and in moral tone of voice. Proper sexuality education prepares the children in understanding their body changes that occur during adolescence period. Adolescent girls are wary of the bodily changes that occur rapidly and also the accompanying feelings and sexual urges. This anxiety aroused is due to fear, lack of awareness, myths and misconceptions. Hence, the need for creating awareness and addressing their misconceptions takes precedence over other things during this period of adolescence. The perception of sexuality education is to transform adolescents' identity, attitude and beliefs about relationship, intimacy, biological and physiological, reproductive health changes that occur during the adolescent years to holistic personality. With this idea a study was undertaken with the following objectives.

Objectives:

1. To assess knowledge level of adolescent girls towards sexuality education
2. To know the attitude of adolescent girls towards sexuality education

Hypotheses:

H_1: There is a significant enhancement in the knowledge of adolescent girls on sexuality education after intervention programme.

H_2: There is a significant enhancement in the attitude of adolescent girls on sexuality education after intervention programme.

Limitation of the study:

The study was restricted only to the adolescent girls in the age groups of 13-15 years, studying in class VII^{std} - X^{std} of Government schools in two selected districts of Manipur state i.e. Imphal East and Imphal West.

Operational Definitions/ terms:

1. Knowledge: Knowledge is a familiarity, awareness or understanding of someone or something, which is acquired by the respondents.
2. Attitude: Attitude is a psychological construct, a mental and emotional entity that inheres in, or characterizes which is acquired by the respondents.
3. Physical changes: Puberty is the process of physical changes through which a child's body matures into an adult body.
4. Anatomy and Physiology: Anatomy and Physiology is the study of the function of body parts and the body as a whole.
5. Puberty: Puberty is the process of physical changes through which a child's body matures into an adult body capable of sexual reproduction.
6. Body images: Body image is a person's perception of the aesthetics or sexual attractiveness of their own body.
7. Family: A family consists of two or more people who care for each other in many ways.
8. Friendship: Friendship is a relationship of mutual affection between people.
9. Values: Value denotes the degree of importance of some thing or action, with the aim of determining what actions are best to do or what way is best to live.
10. Decision making: The process of resulting in the selection of a belief or like or dislike of action among several alternative possibilities.
11. Communication: Communication is the act of conveying meanings or the imparting or exchanging of information by speaking, writing or using some other medium.
12. Looking for help: Finding someone whom can share our problems.
13. Sexual Behaviour: Human sexual behaviour is the manner in which humans experience and express their sexuality.
14. Sexual health: Sexual health is the ability to embrace and enjoy our sexuality throughout our lives.
15. Society and culture: Social and Cultural environments shape the way individual learn about and express their sexuality.
16. Media: Media is the collective communication outlets or tools used to store and deliver information or data.

METHODOLOGY

Imphal district is selected as study region for the present research. The Imphal region comprises of East and West districts. In east region 7 schools and 6 schools from West region were available. For intervention 5 schools from East region and 3 schools from West region were selected randomly. Sample size comprising of 130 from east region and 70 from west region were selected, using simple random sampling technique. The total sample for the study was 200 adolescent girls. Preliminary questionnaire was subjected for reliability and validity and administered for data collection in the selected regions.

Tools for data collection:

A self-administered questionnaire was prepared consisting of a) Socio-economic information, b) Knowledge on sexuality education and c) Attitude on sexuality education. Part -1: Socio-economic information included age, education, siblings, ordinal position, and academic performance, type of family, residence, income and family size.

Part -2: Knowledge Assessment: Knowledge was assessed through a scale having 84 statements with response structure of "Yes or No". For 'Yes' response score 'one' and for 'No' response score 'zero' were assigned, resulting with minimum score '0' and maximum score '84'. The classification of knowledge level was made as Inadequate (≤ 50 % Score), Moderate (51-75 % Score) and Adequate (> 75 % Score).

Part-3: Attitude assessment: Attitude Assessment comprised of 62 statements with five point Likert type of scale having response structure of strongly agree (5), agree (4), undecided (3), disagree (2) and strongly disagree (1). The obtained total score was converted to percentage response. The classification of attitude level was made as- Unfavorable attitude (≤ 50 % Score), Moderate attitude (51-75 % Score) and Favorable attitude (> 75 % Score).

Chi-square test was employed to measure the association between selected variables with knowledge and attitude level.

Intervention:

After obtaining pre-test information from the respondents, an intervention program was conducted on selected sample. The intervention program was conducted using suitable audio-visual aids with appropriate teaching methods with the duration of 3 months.The intervention program was scheduled weekly once for two hours duration covering the following topics:

1. Anatomy and Physiology and Puberty
2. Body images and Family
3. Friendship and values
4. Decision making and communication
5. Looking for help and Sexual Behaviour
6. Sexual health and
7. Society, culture and media.

Audio visual aids used during the intervention programme were charts, posters, leaflet, pamphlet and flashcards. Leaflet and pamphlet developed for the research study were distributed to the respondents during the intervention programme. Storytelling was used and the importance of the dressing styles, type of clothes which were to be worn for public and private occasions were also discussed.

RESULT AND DISCUSSION:

Table 1: Classification of Respondents by Personal Characteristics

N=200

Characteristics	Category	Respondents	
		Number	Percent
Age group	13 years	54	27.0
	14 years	58	29.0
	15 years	88	44.0
Educational level	8th Std	99	99.5
	9th Std	34	17.0
	10th Std	67	33.5
Number of total Siblings	One	94	47.0
	Two	92	46.0
	Three	34	17.0
Number of female siblings	No	72	36.0
	One	94	47.0
	Two	34	17.0
Ordinal position	First	89	44.5
	Second	78	39.0
	Third	33	16.5
Academic performance (Marks)	< 50 %	34	17.0
	50-59 %	37	18.5
	60-69 %	69	34.5
	70+ %	60	30.0
Total		200	100.0

The table reveals that majority (44.0%) of the respondents were noticed in the age of 15 years followed by 29.0 per cent were in the age of 14 years and 27.0 per cent were in the age of 13 years respectively. Majority (99.5%) of the respondents were studying in 8th Standard as compared to 33.5 per cent in 10th Standard and 17.0 percent of the respondents in 9th Standard.

Higher respondents (47.0 per cent of the respondents) had one sibling followed by two siblings (46.0 per cent) whereas 17.0 per cent had three siblings. Majority of the respondent (47.0 per cent) had one female sibling as compared to 36.0 percentage of the respondent (36.0 per cent) had no female sibling and 17.0 per cent had two female siblings.

Majority (44.5%) of the respondents were first ordinal position as compared to 39.0 per centof the respondents were second born and remaining 16.5 per cent of the respondents were third born.

The above table shows that higher respondents (34.5 per cent) secured 60-69% in the academic year followed by 30.0 per cent of the respondents secured 70+ percent and remaining 35.5 per cent of respondents scored less than 60% with academic performance.

Table 2: Classification of Respondents by Family Characteristics

N=200

Characteristics	Category	Respondents	
		Number	Percent
Religion	Hindu	89	44.5
	Christian	37	18.5
	Muslim	10	5.0
	Sanamahism	64	32.0
Type of family	Nuclear	139	69.5
	Joint	56	28.0
	Extended	5	2.5
Place of Residence	Rural	76	38.0
	Semi-urban	25	12.5
	Urban	99	49.5
Family income/month	Below Rs.10,000	57	28.5
	Rs.10,001-20,000	51	25.5
	Rs.20,001-30,000	74	37.0
	Rs.30,001-40,000	18	9.0
Total		200	100.0

The above table reveals that considerable percentages (44.5%) of the respondents were Hindu, followed by 18.5 per cent of the respondents were Christian. whereas 5.0 per cent of the respondents were Muslims and 32.0 per cent of the respondents were Sanamahism religion.

Higher respondents (69.5%) were identified from nuclear family, as compared to 28.0 per cent of the respondents from joint family and less number of the respondent 2.5 per centfrom extended family.

Majority (49.5%) of the respondents were from urban areas, as against 38.0 per cent of the respondents from rural background whereas 12.5 per cent of the respondents were noticed from semi-urban areas.

When the family income was considered it was found that higher of the respondents (37.0%) belong to income group Rs.20,001-30,000 followed by 28.5 per cent of the respondents belonged to income group below Rs.10,000, (25.5%)of the respondents belonged to Rs.10,001-20,000, whereas 9.0 per cent and income group Rs.30,001-40,000 respectively.

Table 3: Classification of Respondents by Educational level of Parents

N=200

Educational level	Respondents			
	Father		Mother	
	Number	Percent	Number	Percent
Up to Primary	43	21.5	74	37.0
Secondary/ High school	59	29.5	77	38.5
PUC	31	15.5	16	8.0
Graduate/ Post Graduate	67	33.5	33	16.5
Total	**200**	**100.0**	**200**	**100.0**

While considering the educational level of the father and mother of the respondents (Table-3) it was found that 33.5 per cent of the respondents' father and 16.5 per cent of the respondents mother were graduate as compared to 29.5 per cent and 38.5 per cent of the respondents father and mother who were high school level respectively. Further the response percentages were 21.5 per cent and 37.0 per cent of the respondents' father and mother had received primary education. The next percentages were 15.5 per cent and 8.0 per cent of the respondent's father and mother with up to PUC education.

Table 4: Classification of Respondents by Occupational status of Parents

N=200

Occupational status	Respondents			
	Father		Mother	
	Number	Percent	Number	Percent
Government	32	16.0	10	5.0
Private	40	20.0	4	2.0
Self employed	31	15.5	2	1.0
House wife	0	0.0	132	66.0
Business	73	36.5	45	22.5
Others	24	12.0	7	3.5
Total	**200**	**100.0**	**200**	**100.0**

Tables-4 indicates the occupations of the parents of the respondents. From the results it was found that 36.5 per cent and 22.5 per cent and 20.0 percent of the respondents' fathers and mothers were involved in business and were privately employed. Majority of the respondents' mothers were housewives (66.0%) followed by business (22.5%). Only 16.0 percent and 15.5 per cent of respondents' fathers were employed in government and were self-employed respectively.

Classification of respondents by personal habits shown in Table-5.Majority (60.0%) of the respondents were involved in walking as personal habits, followed by Jogging 10.0 per cent and 6.5 per cent Yoga. Further equal percentage of 3.5 per cent of respondents were practicing meditation and aerobics.

Table 5: Classification of Respondents by Personal Habits and Reading Habits

Personal Habits	Response		Reading habits	Response	
	N	%		N	%
Walking	120	60.0	Newspapers	66	33.0
Jogging	20	10.0	Magazines	36	18.0
Yoga	13	6.5	Books	122	61.0
Meditation	7	3.5	Journals	10	5.0
Aerobic	7	3.5			

While considering the reading habits of the respondents it was observed that majority (61.0%) of the respondents were reading books followed by 33.0 per cent reading Newspapers, Magazines 18.0 per cent and Journals 5.0 per cent.

Table 6: Classification of Respondents by Physical changes

N=200

No.	Physical changes	Respondents					
		Satisfied		Not-satisfied		Neutral	
		N	%	N	%	N	%
1	Skin colour	134	67.0	37	18.5	29	14.5
2	Teeth	103	51.5	45	22.5	52	26.0
3	Nails	123	61.5	46	23.0	31	15.5
4	Eyes colour	112	56.0	40	20.0	48	24.0
5	Facial features	124	62.0	50	25.0	26	13.0
6	Facial hair	123	61.5	45	22.5	32	16.0
7	Lustre of the hairs	127	63.5	42	21.0	31	15.5
8	Height	147	73.5	40	20.0	13	6.5
9	Weight	143	71.5	41	20.5	16	8.0
10	Shoulders	141	70.5	29	14.5	30	15.0
11	Hip	130	65.0	45	22.5	25	12.5
12	Thighs	129	64.5	44	22.0	27	13.5
13	Arms	150	75.0	30	15.0	20	10.0
14	Breast development	144	72.0	26	13.0	30	15.0

Table -6 indicates the classification of respondents by physical changes. With respect to physical changes in their bodies majority (75.0%) of the respondents were satisfied arms followed by height 73.5per cent, breast development 72.0 per cent, weight 71.5 per cent, shoulders 70.5 per cent and skin color 67.0 per cent. Response on satisfaction noticed on hips 65.0 per cent, thighs (64.5%) lustre of hair (63.5%), 62.0 per cent facial features, nails and facial hair 61.5per cent equal percentage, Eyes color56.0per cent and teeth 51.1 per cent.

Table 7: Classification of Pre-test and Post-test Knowledge level towards Sexuality education

Knowledge Level	Category	Classification of Respondents				χ^2 Value
		Pre test		Post test		
		Number	Percent	Number	Percent	
Inadequate	≤ 50 % Score	108	54.0	0	0.0	237.19*
Moderate	51-75 % Score	92	46.0	73	36.5	
Adequate	> 75 % Score	0	0.0	127	63.5	
Total		200	100.0	200	100.0	

* Significant at 5% level, χ^2 (0.05,2df) = 5.991

Table-7 indicates the classification of pre-test and post-test knowledge levels of respondent towards sexuality education. The results indicate that pre-test knowledge of the respondents was found inadequate with 54.0 percent as compared to 46.0 percent who had moderate knowledge level on sexuality education. Further, 36.5 per cent of respondent in the post test had moderate knowledge level as against remaining 63.5per cent of respondents noticed with adequate knowledge level on Sexuality education. Further, the increase in the knowledge level of respondent from pre-test to post test on sexuality education found to be significance (χ^2 =237.19*).

The research finding is similar with the study conducted by **Sujit** (2014) the attitude of boys towards sex education is significantly more favorable as compared to girls.

However, the study conducted by **Vineeta and Bino** (2015) major conclusion of the study with regards to the strategies adopted by parents towards imparting sex education to their adolescents, shows that majority of the parents prefer using verbal medium of communication to their adolescent as compared to visual medium, parents find it more approachable and less invasive.

Another study conducted by **Padhyegurjar*et.al*** (2012) concluded that health education sessions are very effective in increasing knowledge. However, students tend to lose information regarding certain aspects as time progresses. Students are in need of scientific information from lower classes.

Table-8 depicts classification of pre-test and post-test attitude levels towards sexuality education. The results indicate that pre-test attitude of the respondents in the study sample was found to be unfavorable among 58.5 per centon sexuality education as compared to 41.5 per cent found moderate attitude levels on sexuality education. It is interesting to note that 53.5 percent respondent had moderate attitude in the post test followed by 46.5 per cent noticed with favorable attitude on sexuality education. Further, the classification of pre-test to post-test attitude level on sexuality education was found to be significant (χ^2 =213.03*).

Table 8: Classification of Pre-test and Post-test Attitude level towards Sexuality education

Attitude Level	Category	Classification of Respondents				χ^2 Value
		Pre test		Post test		
		Number	Percent	Number	Percent	
Unfavorable	≤ 50 % Score	117	58.5	0	0.0	213.03*
Moderate	51-75 % Score	83	41.5	107	53.5	
Favorable	> 75 % Score	0	0.0	93	46.5	
Total		200	100.0	200	100.0	

* Significant at 5% level, χ^2 (0.05,2df) = 5.991

In a study conducted by **Jacquelyn Tobey *et.al*** (2006) gender was found to be the most consisted factor in sexual communication, with girls receiving significantly more sex talk than boys from their mother. A study by **Malleshappa*et.al*** (2011) shows how reproductive health education intervention program improves the knowledge and attitude among rural adolescent girls regarding reproductive health. **HitendraThakor and Pradeep Kumar** (2000) in their study claim that a positive attitudinal change was observed after the training, towards extra-marital sex. It also removed the myths associated with masturbation. All students were satisfied with the programme; however, two-third of boys considered the duration insufficient.

Table 9: Overall Pre-test and Post-test Mean Knowledge towards Sexuality education

N=200

Aspects	Max. Score	Respondents Knowledge				Paired 't' Test
		Mean	SD	Mean (%)	SD (%)	
Pre test	84	40.96	5.2	48.8	6.2	78.18*
Post test	84	65.58	5.1	78.1	6.1	
Enhancement	84	24.61	4.5	29.3	5.3	

* Significant at 5% level, t (0.05,199df) = 1.96

Table-9 depicts over all pre-test and post-test mean knowledge of respondents towards sexuality education. It is seen from the finding that the overall pre-test mean knowledge is found to be 48.8 per cent as compared to post-test mean knowledge of 78.1 per cent towards sexuality education. Further the mean enhancement of knowledge from pre-test to post test is found to be 29.3per cent. The data subjected for statistical test reveals the enhancement of knowledge to be statistically significant (t =78.18*).

The research finding is similar to the study conducted by **Malleshappa*et.al*** (2011) indicating that reproductive health education intervention programs improve the knowledge and attitude among rural adolescent girls regarding reproductive health.

Table 10: Overall Pre-test and Post-test Mean Attitude towards Sexuality education

N=200

Aspects	Max. Score	Respondents Attitude				Paired 't' Test
		Mean	SD	Mean (%)	SD (%)	
Pre-test	62	151.31	36.0	48.9	11.6	55.20*
Post-test	62	226.40	28.2	73.0	9.1	
Enhancement	62	75.09	19.3	24.2	6.2	

* Significant at 5% level, t (0.05, 199df) = 1.96

Table-10 depicts the overall pre-test and post-test mean attitude scores of respondents towards sexuality education. It is seen from the finding that the overall pre-test mean attitude is found to be 48.9 percent as compared to post-test mean attitude of 73.0 per cent towards sexuality education. Further, the enhancement of attitude from pre-test to post-test found to be 24.2per cent. The data subjected for statistical test reveals the enhancement of knowledge to be significant (t =55.20*).

The research finding is similar to the study conducted by **KamalpreetKourToor (**2012). The results of the study also reveal that economic status of parents has no effect on their attitude towards sex education. The attitude of boys towards sex education is significantly more favorable as compared to girls. **RangappaManjula*et.al*** (2012) in their study shows that there were substantial lacunae in the knowledge about reproductive health among the study group. After educational intervention, there was significant change in the knowledge. Students felt that sex education is necessary in school and should be introduced in the school syllabus.

CONCLUSION

The overall pre-test knowledge was found to be 48.8 per cent as compared post-test at 78.1 per cent. The enhancement of knowledge score from pre-test to post test was found to be 29.3 per cent due to the effectiveness of intervention programme. The data subjected for statistical test reveals that enhancement of knowledge is found to be statistically significant (t=78.18*, $p<0.05$). The finding indicates that pre-test mean attitude score is found to be 48.9 per cent as compared to post-test 73.0 per cent. The enhancement of attitude score from pre-test to post test is found to be 24.2 per cent. The data subjected for statistical test reveals that the enhancement of knowledge is found to be statistically significant (t =55.20*, $p<0.05$). It can be concluded that there is a need to conduct orientation and effective training programme at school level to enhance the existing knowledge on sexuality education among adolescent girls.

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IMPACT OF GENDER ON NUTRITIONAL STATUS AND LIFESTYLE PATTERN OF ADOLESCENTS

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ABSTRACT

The World Health Organization defined human health as "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity" (WHO, 1948). India is a home to more than 243 million adolescents, who account for a quarter of the country's population. NCERT (1999) defined adolescence as a period of physical, psychological, emotional and social maturity from childhood to adulthood. Nutrition, being an important determinant of physical growth of adolescents, is an important area that needs attention. Hence a study was undertaken with the objective to assess the nutritional status and lifestyle pattern of adolescents. The present study was undertaken in the Government School, Doddanekkundhi, Banagalore during the year 2018. Study population comprised of a total of 100 respondents aged between 13 and 16 years including boys and girls. A questionnaire was administered to get socio-economic status, nutritional status and lifestyle pattern of the respondents. Personal habits like physical activity, time spent for watching television, hygiene practices, personal habits like smoking or drinking were also assessed. The respondents were categorized based on the scores obtained. The Chi Square test was done to find the significant association between boys and girls. It was observed that there were equal number of boys and girls and maximum percentage belonged to the age group of 13-14 years category. More number of respondents had two siblings. The environmental assessments showed that majority of the respondents (89%) were from nuclear families. Equal number of boys and girls (36%) were in the normal BMI range while equal and more number of boys and girls (64%) fell in underweight category. The nutritional status was moderate among adolescent boys and girls. There was a statistically significant difference between boys and girls in physical activity pattern ($P<0.05$). Sleep pattern, time spent for watching television and personal habits were found to be similar among boys and girls ($P>0.05$). The present study would examine the etiological factors that may be responsible for poor nutrition among them. It hopes to evolve viable strategies for prevention and management of malnourishment and to promote good lifestyle practices among adolescents.

Keywords: Adolescents, Nutrition, Lifestyle behaviours, Health and wellbeing

INTRODUCTION

India is home to more than 243 million adolescents, who account for a quarter of the country's population. Adolescent period of a child's life is of great importance. Adolescence is a period when development of the reproductive system, sexual maturation and issues relating to identity, gender roles and related problems arise.

Nutritional status is one of the indicators of the overall well-being of population and human resource development. India, being a country in development transition, faces the dual burden of pre-transition, lifestyle-related degenerative disease such as obesity, diabetes, hypertension, cardiovascular disease and cancer (Bashir, 2013).

One's lifestyle can be healthy or unhealthy based on nutrition, physical activity levels, and overall personal behaviors. A positive lifestyle can bring health and happiness, while a negative lifestyle can lead to illness and depression (Longman, 2008 and El-Baz, 2004). An essential component in the prevention and management of diseases is the adoption of a healthy lifestyle that would include the promotion of non-smoking, eating a healthy balanced diet, and actively engaging in organized physical activities (Nakamura, 2008 and Siegrist et al., 2011). Long hours of exposure to television programs were also associated with increased risk of obesity in children. Current guidelines suggest that children should spend no more than 2 hr per day viewing all electronic entertainment media (American Academy of Pediatrics, 2001).

Sleep is a biological necessity and essential for health and daily functioning. It is as important as a healthy diet and regular physical activity. In adolescence, the brain is still developing, and sleep is essential to healthy brain development. Regular physical activity burns calories and builds muscle, makes one look and feel good and keeps weight off. Several studies have shown that increased physical activity decreases the incidence of cardiovascular diseases, stroke, and improves psychological well-being (Carlos et al., 2015). Insufficient physical activity is the fourth leading risk factor for global mortality.

The origins of many of the illnesses of adulthood also have their roots in the health behaviors of childhood and adolescence. However, majority of the childhood illnesses are preventable by promotion of good practices among school children. Nutrition, being an important determinant of physical growth of adolescents, is an important area that needs attention. So there is a great need to focus our attention towards their nutritional status and lifestyle pattern. Hence the present study was undertaken. The main aim of this study is to assess the nutritional status and lifestyle pattern of adolescents.

Objectives

1. To know the socio-economic background of the adolescent boys and girls
2. To study the somatic status of the adolescent boys and girls
3. To assess the life style pattern of the adolescent boys and girls

HYPOTHESES

Ho(1): There is no significant difference in the somatic status of boys and girls
Ho(2): There is no significant difference in the dietary habits of boys and girls
Ho(3): There is no significant difference in the physical activity pattern of boys and girls
Ho(4): There is no significant difference in the knowledge on hygiene and practice level of boys and girls

REVIEW OF LITERATURE

Adolescence is a significant period for physical growth and sexual maturation. Nutrition, being an important determinant of physical growth of adolescents, is an important area that needs attention. Due to rapid growth spurt and increased physical activity adolescents have increased nutritional requirements demanding diet which is rich in protein, vitamins, calcium, iodine, phosphorus and iron. NFHS (2005) data shows, in the age group 15–19 years, 47% girls and 58% boys were thin, 56% girls and 30% boys were anemic, 2.4% girls and 31.7% boys were overweight and 2/1000 adolescent girls and 1/1000 adolescent boys suffer from diabetes.

Use of mass media is higher among adolescents (male 88.2% and female 71.5%) (Statistics, Adolescents, 2014). It plays an important role in habit-picking and decides their lifestyle pattern. Its influence is clearly shown in a study from Chennai, done in the age group 11 to 17 years, reporting that, 90% eat either food or snacks while watching TV, 82% buy food products and snacks based on advertisement, 59% skipped outdoor activities for TV, 42% follows diet and 42% exercise to get the body like their favorite media personality (Priyadarshini et al., 2013). Television viewing in childhood and adolescence is associated with overweight, poor fitness, smoking and raised cholesterol in adulthood (Hancox et al., 2004). Globally, 81% of adolescents aged 11-17 years were insufficiently physically active in 2010. Adolescent girls were less active than adolescent boys, with 84% vs. 78% not meeting WHO recommendations

Since sleep and growth are related, it is important that robust nutritional support and opportunities for adequate sleep are considered in the health of adolescent girls and boys, who may be in the workforce and forced to sleep out of synchrony with their natural clocks (Roenneberg, 2004).

Hygiene practices are employed as preventative measures to reduce the incidence and spreading of disease. Lack of personal hygiene coupled with poor sanitation favour person-person transmission of infection. Infection and malnutrition form a vicious circle and retard children's physical development. Repeated attacks of infections often compound the existing poor health of children, compromising children's attendance and performance at school and can even result in death (DDWS, 2004).

METHODOLOGY

The present study entitled “Nutritional status and Life style pattern of adolescents” was undertaken in the Government School, Doddanekkundhi, Banagalore during the year 2018. Study population comprised of a total of 100 respondents aged between 13 and 16 years, including boys and girls from 8th and 9th standards. Respondents were selected on the basis of their willingness to be a part of the study.

Basic information of the respondents such as age, gender, type of family, siblings and family income were collected from the respondents using structured questionnaire. Their type of diet and the meal pattern were also included for the study. Nutritional status of respondents was assessed by taking anthropometric measurements like height and weight. BMI of the respondents was calculated.Lifestyle habits like sleep pattern, physical activity, time spent for watching television and personal habits were also assessed. A total of 13 statements related to their daily hygiene

habits and personal care like hand washing, bathing, tooth care, changing dress etc, was used for the study to assess the knowledge of the respondents. The respondents were categorized based on the scores obtained.

Research Design: Survey method is used to assess the nutritional status and lifestyle pattern among the adolescents.

RESULTS AND DISCUSSIONS

The findings of the study are presented here.

A. Socioeconomic Status:

Table 1: Classification of respondents by Age group and Class studying

N=100

Characteristics	Category	Sample (%)	Respondents				$\chi 2$ Test
			Boys		Girls		
			N	%	N	%	
Age group (years)	13-14	53	18	36.0	35	70.0	11.60*
	15-16	47	32	64.0	15	30.0	
Class of study	8th Std	50	27	54.0	23	46.0	0.64 NS
	9th Std	50	23	46.0	27	54.0	
Total		**100**	**50**	**100.0**	**50**	**100.0**	

* Significant at 5% level, NS : Non-significant, $\chi 2$ (0.05,1df) = 3.841

Table-1 presents classification of respondents by age group and class of study. Majority of girls (70%) were in the age group 13-14 as compared to boys (36%) and maximum number of boys (64%) were in the age group 15-16 as compared to girls (30%). However, the age difference among boys and girls was found to be significant ($\chi 2$=11.60). Slightly higher percentage of boys (54%) is noticed in 8th standard. Similarly higher percentage of girls (54%) is observed in 9th standard (Table-1).

Table 2: Classification of Respondents by Number of siblings

N=100

Number of siblings	Category	Sample (%)	Respondents				$\chi 2$ Test
			Boys		Girls		
			N	%	N	%	
Brothers	No	34	18	36.0	16	32.0	0.69 NS
	One	50	23	46.0	27	54.0	
	Two+	16	9	18.0	7	14.0	
Sisters	No	43	22	44.0	21	42.0	1.10 NS
	One	32	20	40.0	12	24.0	
	Two+	25	8	16.0	17	34.0	
Total		100	50	100.0	50	100.0	

NS : Non-significant, $\chi 2$ (0.05,2df) = 5.991

Table-2 represents the classification of respondents by number of siblings. More number of respondents had no siblings where as 46 per cent of boys had one brother, 40 per cent had one sister, 18 per cent had two brothers and 16 per cent had two sisters. Among the girls, 54 per cent had one brother, 24 per cent had one sister, 14 per cent had two brothers and 34 per cent had two sisters.

Table-3: Type of family and Family size of the respondents

N=100

Characteristics	Category	Sample (%)	Respondents				$\chi 2$ Test
			Boys		Girls		
			N	%	N	%	
Type of family	Nuclear	89	47	94.0	42	84.0	2.55 NS
	Joint	11	3	6.0	8	16.0	
Family size (members	3-4	49	28	56.0	21	42.0	4.66 NS
	5-6	44	21	42.0	23	46.0	
	7-8	7	1	2.0	6	12.0	
Total		100	50	100.0	50	100.0	

NS: Non-significant, $\chi 2$ (0.05,1df) = 3.841, $\chi 2$ (0.05,2df) = 5.991

Table-3 depicts the type of family and family size of the respondents. Majority of the respondents were from nuclear family (89%). Only 6 per cent of boys and 16 per cent of girls were from joint family. Maximum percentage of boys' families composed of 3-4 members (56%) and maximum percentage of girls' families composed of 5-6 members (46%). Only 7 percent of students had 7-8 members in their families.

Table-4: Classification of Respondents on Family Income

Family income/month	Respondents(n=100)						$\chi 2$ Test
	Boys		Girls		Combined		
	N	%	N	%	N	%	
Rs.5,000-10,000	9	18.0	14	28.0	23	23.0	1.41 NS
Rs.10,000-15,000	25	50.0	22	44.0	47	47.0	
Rs.15,000-25,000	16	32.0	14	28.0	30	30.0	
Total	50	100.0	50	100.0	100	100.0	

NS : Non-significant, $\chi 2$ (0.05,2df) = 5.991

Table 4 depicts the monthly income of the family from different sources. The family income of most of respondents (47%) was between Rs.10,000-15,000. The families of 23 per cent of respondents had their income between Rs.5,000-10,000 per month.

B. **Somatic status:**

Anthropomorphic is a convenient and reliable technique whereby changes in the status of nutrition can be evaluated easily. It also provides a means of monitoring the appropriateness of nutritional therapy.

Table 5: Classification of Respondents on Height and Weight

N=100

Characteristics	Category	Sample (%)	Respondents				χ^2 Test
			Boys		Girls		
			N	%	N	%	
Height (cm)	141-150	23	6	12.0	17	34.0	19.67*
	151-160	56	25	50.0	31	62.0	
	161-170	21	19	38.0	2	4.0	
Weight (kg)	25-40	26	7	14.0	19	38.0	7.52*
	41-49	54	31	62.0	23	46.0	
	50-59	20	12	24.0	8	16.0	
Total		100	50	100.0	50	100.0	

* Significant at 5% level, χ^2 (0.05,2df) = 5.991

Table-5 represents the classification of respondents by height and weight. A half of the boys (50%) and most of the girls (62%) were in the height range of 151-160 c.m. whereas 23 per cent and 21 per cent of respondents fell in the range of 141-150 cm and 161-170 cm category respectively. The weight of majority of boys (62%) and less than half of the girls (46%) was between 41-49 kg. A considerable (26 %) of respondents fell in 25-40 kg weight category. The difference in the height and weight of the respondents between the two groups was statistically significant ($p<0.05$).

Table 6: Classification of Respondents on Body Mass Index (BMI)

Body mass index (BMI)	Respondents N=100						χ^2 Test
	Boys		Girls		Combined		
	N	%	N	%	N	%	
Under weight (< 18.5)	32	64.0	32	64.0	64	64.0	0.00 NS
Normal (18.5-24.9)	18	36.0	18	36.0	36	36.0	
Total	50	100.0	50	100.0	100	100.0	

NS : Non-significant, χ^2 (0.05,1df) = 3.841

Table-6 classifies the respondents on body mass index. An equal number of boys and girls (64%) were underweight. Similarly an equal number of boys and girls (36%) fell under normal BMI category. Combined results of boys and girls showed that more respondents were underweight than normal ones. None of the adolescents were found to be obese. The main reason for the large number of underweight respondents could be their poor socio-economic background, food being unaffordable and the ignorance of parents in terms of nutrition. The nutritional status was moderate among adolescents of the present study population. The hypothesis Ho(1) is accepted i.e. There is no significant difference in the somatic status of boys and girls.

Present research findings are similar with the other following studies.

Choudhary et al, (2003), reported that 68.52 per cent of adolescents had BMI less than 18.5 kg/square meter in rural area of Varanasi. Deshmukh et al., (2016) said that a cross-sectional study was carried out in two PHC areas of Wardha district with two stage sampling method. Overall, 53.8 per cent of the adolescents were thin, 44 per cent were normal and 2.2 per cent were overweight.

C . Lifestyle behaviour:

Table-7 indicates the respondents' type of diet and the number of meals consumed per day. A total of 62 per cent adolescents (74% of boys and 50% of girls) were found to be non-vegetarian. More number of girls (50%) were vegetarian as compared to boys being 26 per cent.

Table 7: Classification of Respondents on Type of Diet and Meals Consumed

Characteristics	Category	Sample (%)	Respondents N=100				$\chi 2$ Test
			Boys		Girls		
			N	%	N	%	
Type of diet	Vegetarian	38	13	26.0	25	50.0	6.11*
	Non-vegetarian	62	37	74.0	25	50.0	
Meals consumed per day	Two	15	6	12.0	9	18.0	10.27*
	Three	64	27	54.0	37	74.0	
	Four	12	10	20.0	2	4.0	
	Four+	9	7	14.0	2	4.0	
Total		100	50	100.0	50	100.0	

* Significant at 5% level, $\chi 2$ (0.05,1df) = 3.841, $\chi 2$ (0.05,3df) = 7.815

Majority of the respondents (64%) followed a three meal pattern. Twelve per cent boys and 18 per cent of girls followed a two meal pattern. Number of respondents following four patterns was more among boys (20%) than girls (4%). There was a significant difference in the type of diet and the number of meals consumed among the two groups ($p<0.05$). The hypothesis Ho(2) is rejected i.e. There is no significant difference in the dietary habits of boys and girls

Table 8: Classification of Respondents by Sleep Cycle and Duration of Sleep

Characteristics	Category	Sample (%)	Respondents -N=100				$\chi 2$ Test
			Boys		Girls		
			N	%	N	%	
Sleep cycle	Good	86	43	86.0	43	86.0	0.31 NS
	Moderate	9	4	8.0	5	10.0	
	Disturbed	5	3	6.0	2	4.0	
Average Duration of sleep /day	6-7	33	20	40.0	13	26.0	2.32 NS
	7-8	41	19	38.0	22	44.0	
	9-10	26	11	22.0	15	30.0	
Total		**100**	**50**	**100.0**	**50**	**100.0**	

NS : Non-significant, $\chi 2$ (0.05,2df) = 5.991

Table-8 represents the sleep pattern of the respondents. Maximum and equal number of boys and girls (86%) were found to have good sleep at night. 10 per cent of girls and 8 per cent of boys had reported having moderate sleep while only 5 per cent of respondents (6% of boys and 4% of girls) had disturbed sleep pattern. Maximum number of respondents (44% of girls and 38% of boys) had reported having 7-8 hours of sleep. 9-10 hours of sleep duration was observed among 22 per cent of boys and 30 per cent of girls.

Table 9: Classification of Respondents on Physical activity, Personal habits and Time spent for watching Television

Aspects	Category	Sample (%)	Respondents N=100				$\chi 2$ Test
			Boys (n=50)		Girls (n=50)		
			N	%	N	%	
Physical activity	Walking	30	9	18.0	21	42.0	20.35*
	Exercise	16	2	4.0	14	28.0	
	Jogging	2	2	4.0	0	0.0	
	Cycling	43	28	56.0	15	30.0	
	Yoga	4	4	8.0	6	12.0	
	Meditation	1	1	2.0	0	0.0	
Personal habit	Smoking	1	1	2.0	0	0.0	-
	Drinking	0	0	0.0	0	0.0	
Spent for TV watching	1-2 hrs	44	27	54.0	17	34.0	4.18^{NS}
	2-3 hrs	38	15	30.0	23	46.0	
	3-4 hrs	18	8	16.0	10	20.0	

* Significant at 5% level NS : Non-significant

Table-9 shows information regarding physical activity, personal habits and time spent for watching T.V. Maximum number of boys (56%) were found to be doing cycling than girls (30%) whereas more number of girls (42%) were found to do walking than boys (18%). Sixteen per cent of adolescents did exercise. Only few respondents were interested in doing jogging, yoga and meditation. There was a statistically significant difference between boys and girls in physical activity pattern ($\chi 2$=20.35). The hypothesis Ho(3) is rejected i.e. There is no significant difference in the physical activity pattern of boys and girls.Only one boy (2%) was found to have smoking habit. Majority of the respondents (54% of boys and 34% of girls) had reported spending 1-2 hours for watching television. More girls (46%) were observed to spend 2-3 hours for watching television than boys (30%). Eighteen per cent of the adolescents were found to be spending 3-4 hours.

Similar study was conducted by Singh and Kaur (2000).It was found that the amount of time children spend in front of television sets is extraordinary. An average child watches for over 3 hours per day, clocking in a total of 25 hours in a single week. Gaikwad and Patnam (2000) found that majority of the children were the viewers of the multiple TV channels, spending 2 to 21/2 hours time on TV viewing per day.

Knowledge level on Hygiene and Practice Level: Knowledge Level on Hygiene and practice level were studied**.**

Table-10 represents the gender wise response on knowledge level on hygiene and practice. More number of respondents (38% of girls and 32% of boys) were found to have adequate knowledge on personal hygiene and in practice. Number of boys (50%) were more in 'inadequate' category than girls (16%) and also number of girls (46%) were more in' moderate 'level category than boys (18%). The difference in knowledge on hygiene and personal care among the two groups was found be statistically significant (χ^2=15.14).

Table 10: Gender Wise Response on Knowledge level on Hygiene and Practice Level

Hygiene and Practice Level	Classification of Respondents						χ^2 Value
	Boys		Girls		Combined		
	N	%	N	%	N	%	
Inadequate	25	50.0	8	16.0	33	33.0	15.14*
Moderate	9	18.0	23	46.0	32	32.0	
Adequate	16	32.0	19	38.0	35	35.0	
Total	50	100.0	50	100.0	100	100.0	

* Significant at 5% level, χ^2 (0.05,2df) = 5.991

Table-11 shows over all mean scores on Knowledge level on Hygiene and Practice on various aspects

Table 11: Over all Mean Knowledge scores on Knowledge level on Hygiene and Practice Aspects

Aspects	Sample (n)	Max. Score	Knowledge Scores N=100				't' Test
			Mean	SD	Mean (%)	SD (%)	
Boys	50	13	7.40	2.6	56.9	20.4	2.63*
Girls	50	13	8.72	2.4	67.1	18.3	
Combined	100	13	8.06	2.6	62.0	20.0	

* Significant at 5% level t (0.05,98df) = 1.96

The mean knowledge scores of girls (67.1%) on personal hygiene and practice level were found to be more than boys (56.9%). There was a statistically significant difference in the mean knowledge scores between boys and girls (t=2.63). The hypothesis H(4)is rejected i.e. There is no significant difference in the knowledge on hygiene and practice level of boys and girls.

SUMMARY

Adolescence is the period of transition from childhood to adulthood. Adolescence offers the last opportunity to intervene and recover growth, faltered in childhood and also support growth spurt and skeletal development to break the vicious cycle of inter-generational under-nutrition. Adolescence is the time to learn and adopt healthy habits to avoid many health and nutritional problems later in life.

In the present study, maximum percentage of the respondents belonged to the age group of 13-14 years. The environmental assessments showed that majority of the respondents were from nuclear families. More number of families (44%) constituted 5-6 members. The family income of most of the respondents ranged from Rs. 10,000-Rs. 15,000. The environmental assessment showed that the respondents were from poor socio-economic background.

A majority of the respondents were in the height range of 151-160 cm. The weight of majority of boys (31%) and girls (23%) was between 41-49kgs. An equal and more number of boys and girls (64%) were found to be in the underweight category. Similarly an equal number of boys and girls (36%) fell under normal BMI category. None of the adolescents were found to be obese. The nutritional status was moderate among adolescent boys and girls.

In the present study, more boys were found to be non-vegetarian than girls. Majority of the respondents followed a three full meals pattern daily. Maximum number of adolescents had 7-8 hours of good sleep. Majority of the respondents were observed to commute to school by walk. Few used bicycles too. The mode by which they commute to school was itself a big physical activity for their age. They also reported spending 1-2 hours for games in school. Only one boy (2%) was found to have smoking habit. Majority of the respondents had reported spending 1-2 hours for watching television. The mean knowledge scores of girls on personal hygiene and practice level were found to be more (67.1%) than boys (56.9%). The overall lifestyle pattern regarding physical activity, sleep, time spent for watching television, habits like drinking/smoking and personal hygiene practices was better among the adolescents.

CONCLUSION

Nutritional status of adolescents is influenced by several factors namely, socio-economic status, somatic status, physical activity and knowledge on health and hygiene.In the present study, the respondents were from the poor socio-economic background. The somatic status indicated that majority were in the underweight BMI category. The nutritional status was moderate and found to be more similar among boys and girls ($P>0.05$). The physical activity established significant difference by gender ($P<0.05$). However, significant difference is not observed in sleep pattern, time spent for watching television and personal habits among boys and girls ($P>0.05$). The study can be useful to identify the determinants of health awareness among adolescents. It is very much important that certain actions be taken through frequent nutrition and lifestyle awareness programs with special emphasis like education regarding nutrient requirements, snacking habits, choice of healthy food options, healthy eating tips, importance of physical activity, sleep and personal hygiene practices etc, so that adverse health consequences can be avoided, and the quality of life of the adolescent improves in general.

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CONSUMPTION OF SOFT DRINKS AMONG ADOLESCENT GIRLS

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ABSTRACT

Nutritional and lifestyle transition due to globalization, has resulted in many of the adolescents modifying their normal dietary pattern and following disturbed eating behaviours (Mishra and Mukhopadhyay, 2010) including soft drink consumption which has become a pronounced behaviour in them. The present study was conceived with the objective of finding out the facets of consumption of soft drinks among adolescent girls. Four hundred and fifty adolescent girls studying in the Higher Secondary Schools in the urban, rural and coastal areas of Kollam district of Kerala were selected as the samples of the study (Power calculation at 80 per cent) using Stratified sampling technique. Survey method was employed in the conduct of the study. Statistical significance was verified at the level of $p \leq 0.05$. The results of the study revealed that more than three quarter of the adolescent girls (76. 0 per cent) from the urban, rural and coastal localities consumed soft drinks. The frequency of consumption of soft drinks revealed that 43.3 per cent of the adolescent girls from the three localities of study consumed it occasionally. Chi square test done to find out the relation between the personal, social and economic characteristics of the adolescent girls and their frequency of soft drink consumption revealed that only type of institution of study ($\chi 2 = 77.213$, $p=0.000$,$df=2$) of the adolescent girls was related statistically significant at 1 per cent level with girls learning in private institutions consuming soft drinks more frequently. The reasons for consumption of soft drinks were reported by the adolescent girls from the three localities of study as advertisement (85.7%), taste (83.3%), convenience (78.5%) and easy availability (53.5%). Internet served as the most important source of information on soft drinks in urban areas whereas, Television was the prime source for the adolescent girls from rural and coastal areas. Healthy dietary patterns being a global priority to reduce non- communicable diseases, soft drink consumption among the adolescent girl population should be effectively curbed as they are the 'soon mothers- to- be' whose health would determine the future of the upcoming generations.

Keywords: Soft drinks, Adolescent girls.

INTRODUCTION

Existence of a nutritional transition across the globe has been corroborated as countries have shifted towards a more "westernized" diet, albeit at different rates of progression (Popkin et al, 2012). Though the consumption of healthy food items has increased modestly during the last two decades around the world, the consumption of unhealthy food items has increased to a greater extent (Imamura et al, 2015). The consumption of soft drinks has become highly visible in the present society (Vartanian et al, 2007). Weichselbaum and Buttriss (2011) noticed that soft drinks are increasingly consumed by people of all ages. Nutritional and lifestyle transition due to globalization, has resulted in many of the adolescents modifying their normal dietary pattern and following disturbed eating behaviours (Mishra and Mukhopadhyay, 2010) including soft drink consumption which has become a pronounced behaviour in them.

OBJECTIVES

The objective of the study was to find out the facets of consumption of soft drinks among adolescent girls.

REVIEW OF LITERATURE

The per capita soft drink consumption has increased almost 500% over the past 50 years (Heshmat, 2011). A third of teenagers drink at least three cans of soda a day and on the average adolescents get about 11% of their calories from soft drinks which corresponds to about 15 teaspoons of sugar (Grimm et al, 2004).

Soft drink intake is a marker for poor nutrition, with individuals who consume more sweetened beverages eating poorer diets in general. Soft drink consumption have been negatively associated with overall healthy eating index (Rodriguez et al, 2003) and average adequacy of intake of a variety of vitamins and nutrients (Schulze et al, 2004).

Association between soft drink consumption and nutrition and health outcomes have revealed that soft drink intake was strongly associated with increased energy intake and body weight and also with lower intakes of milk, calcium, and other nutrients and with an increased risk of several medical problems like diabetes (Lenny et al, 2007).

Soft drink consumption is negatively associated with bone mineral density and increased risk of bone fracture (Vartanian et al, 2007).

METHODOLOGY

Four hundred and fifty adolescent girls studying in the Higher Secondary Schools in the urban, rural and coastal areas of Kollam district of Kerala were selected as the samples of the study (Power calculation at 80 per cent) using Stratified sampling technique. Survey method was employed in the conduct of the study. Statistical significance was verified at the level of $p \leq 0.05$. Results were discussed and summarized.

RESULTS

The major results of the study evolved as follows.

1. Details on consumption of soft drinks

Soft drinks contribute up to 10 -15% of the total daily energy intake among children and adolescents in the United States (Wang et al, 2008). A soft drink is a beverage, often carbonated, that does not contain alcohol. Beverages like colas and bottled drinks with or without fizz have been considered as soft drinks in the present study. Details on consumption of soft drinks by the adolescent girls bring out information on the habit of consumption of soft drinks, its frequency and reasons for consumption and is presented in Table 1.

1.1. Habit of consumption of soft drinks

The habit of consumption of soft drinks as noticed from Table 1, revealed that more than three quarter of the adolescent girls from the urban, rural and coastal localities (76. 0 per cent)

consumed soft drinks. The popularity of soft drinks among the emerging youth, irrespective of their locality of residence, attests soft drink consumption as a recognised behaviour among adolescents. However, Singh and Singh (2008) observed high consumption of carbonated drinks as part of the urban adolescent's diet.

Table 1: Distribution of the adolescent girls with respect to consumption of soft drinks

Details on consumption of soft drinks	**Total**	**Place of residence**		
		Urban	**Rural**	**Coastal**
Habit of consumption of soft drinks	**N= 450**	**N=123**	**N=256**	**N=71**
Consume soft drinks	342(76.0)	102(82.9)	197(77.0)	43(60.6)
Do not consume soft drinks	108(24.0)	21(17.1)	59(23.0)	28(39.4)
Frequency of consumption of soft drinks	**N=342**	**N=102**	**N=197**	**N=43**
Once or twice a week	37(10.8)	37(36.3)	-	-
Once or twice a month	157(45.9)	55(53.9)	83(42.1)	19(44.2)
Occasionally	148(43.3)	10(9.8)	114(57.9)	24(55.8)
Reasons for consumption of soft drinks*	**N=342**	**N=102**	**N=197**	**N=43**
Advertisement	293 (85.7)	89(87.3)	169(85.8)	35(81.4)
Taste	285(83.3)	90(88.2)	161(81.7)	34(79.1)
Convenience	208(60.8)	77(78.5)	106(53.8)	25(58.1)
Easy availability	183 (53.5)	70(68.6)	97(49.2)	16(37.2)
Hygienic than fresh juices	150(43.8)	75(73.5)	61(30.9)	14(32.6)

*Multiple responses *Figures in parenthesis show percentage*

The Chi square test of significance done to find out the relationship between the personal, social and economic characteristics of the adolescent girls with their habit of consumption of soft drinks, revealed that none of the characteristics were statistically related to this habit. This is in contrast to the study done by Gour et al (2010) who reported more frequent drinking of soft drinks among the students of private schools than government schools. Vereecken (2005) found that children of parents with higher occupational status had lower soft drink consumption. However, Janssen et al (2004) observed a significant increase in soft drink consumption with increasing family affluence. Shi et al (2005) reported that soft drinks were consumed more by adolescents belonging to high socio-economic status. The present study results contradict these studies, as the type of institution of study, occupational status of parents and family income of the adolescent girls were not found to be statistically related to their habit of soft drink consumption.

1.2. Frequency of consumption of soft drinks

With regard to the frequency of consumption of soft drinks, from Table 1, it was noticed that 43.3 per cent of the adolescent girls from the three localities of study consumed it occasionally. Majority of the occasional consumers were noticed to be the rural girls (57.9 per cent). More than half of the coastal girls (55.8 per cent) also consumed soft drinks occasionally. The frequency of consumption was noted to be highest among the urban girls with one third of these girls (36.3 per cent) consuming it once or twice a week and more than half of them (53.9 per cent) consuming it once or twice a month. The fondness for soft drinks was also evident among the rural (42.1 per cent) and coastal girls (44.2 per cent) consuming it once or twice a month.

Soft drinks being sugar dense products supplying empty calories are definitely not a healthy diet choice for the adolescent girls. Nielsen and Popkin (2004) noticed that as soft-drink consumption increased in adolescence, their dietary quality declined. Khemani (2004) also warned that frequent soft drink consumption among the adolescents is nutrient compromising and health risky. With Mise et al (2013) pointing out that soft drinks being a popular beverage among the younger generations, this unhealthy trend should be reversed especially among the young girls before they succumb to its far reaching health consequences.

Chi square test done to find out the relation between the personal, social and economic characteristics of the adolescent girls and their frequency of soft drink consumption revealed that only type of institution of study ($\chi 2$ =77.213, p=0.000,df=2) of the adolescent girls was related statistically significant at 1 per cent level with girls learning in private institutions consuming soft drinks more frequently.

1.3. Reasons for consumption of soft drinks

As noticed from Table 1, varied reasons were cited by the adolescent girls for consuming soft drinks. It was surprisingly noted that 85.7 per cent of the adolescent girls from the three localities of study reported advertisement as the reason for consumption of soft drinks. This revealed the adolescent vulnerability to mass media and the influence it exerted with regard to their food consumption. The finding of this study complements the observation made by Anand (2013) that advertisements in different medias play an important role in influencing students into buying soft drinks. Taste was reported by a huge majority of 83.3 per cent of girls from all the localities as the reason for consumption. This result is similar to the findings of Sandhar et al (2013); Grimm et al (2004) that taste is the strongest predictor in consumption of soft drinks. Sweetman et al (2008) also has reported that the desire to consume soft drinks in children is related to a liking for consuming sweetened drinks, rather than to thirst or hunger. The convenience in carrying the bottled soft drinks to be consumed later, attracted a majority of 78.5 per cent of adolescent girls from urban areas to it. More than half of the girls from the three areas (53.5 per cent) consumed soft drinks because of its easy availability. Less than half the girls from all the three localities (43.8per cent) consumed soft drinks as they considered it more hygienic than fresh juices.

Adolescent age being the time when attitudes that determine their lifelong behaviours are formed, the messages given to this population through the mass media should be subjected to stringent standards. In the light of Batada et al (2008) stating that Television advertisements have an important role in promoting unhealthy dietary practices, especially the consumption of

foods high in added sugar, the adolescents should be made aware of the merits of healthy food consumption. Denney et al (2009) observed that soft drinks are heavily marketed to adolescents. The adolescents patronize soft drinks endorsed by the brand ambassadors, who are popular youth icons. These energy dense drinks marketed through media advertisements are consumed by the adolescents by totally ignoring its nutritional content. As revealed from this study, a considerable proportion of the adolescent girls are being lured into consuming soft drinks by the influence of advertisements, irrespective of their locality of residence and it is the need of the hour to raise their awareness on the ill effects of consuming these artificial drinks.

2. Source of information on soft drinks

The adolescent girls were asked to rank their source of information on soft drinks in the order of hierarchy (first rank being given to the most important source and last rank to the least important). These ranks were averaged to get the aggregate ranking, the least average was considered the first rank and the highest average was considered the last rank. The result is given in Table 2.

Table 2: Ranking given by the adolescent girls with respect to their source of information on soft drinks

Source of information on soft drinks	Place of residence		
	Urban N=123	Rural N=256	Coastal N=71
Television	2	1	1
Magazines	4	3	2
Radio	5	2	3
Teachers	3	4	4
Internet	1	6	7
Newspaper	8	5	5
Friends	7	7	8
Parents	6	8	6
Siblings	9	9	9

Ranking done to find the source of information of the adolescent girls on soft drinks noted from Table 2, revealed that Internet served as the most important source of information on soft drinks in urban areas, whereas it was ranked low by the adolescent girls from the rural and coastal areas. Television which was ranked as the second most important source by the adolescent girls from urban areas was ranked as the prime source by the adolescent girls from rural and coastal

areas, where the use of internet has not yet caught up on a wide scale. This points to the role of communication technologies as powerful forces shaping the lives of adolescents. This finding complements the report of Ata et al (2007) that media usage was fairly heavy among adolescents and their eating habits were strongly influenced by the mass media messages (Giskes et al, 2005). However, the print media was not popular with the urban girls and newspapers were ranked as the second last source of information on soft drinks. Siblings were reported as the least important source of information by the adolescent girls from all the three localities.

The test for rank correlation co - efficient was done on the source of information of the adolescent girls on soft drinks. The test for rank correlation co - efficient investigated whether the difference between the sample correlation co - efficient and zero is statistically significant. When the significance level is below the critical value of 0.05, it means that the sample correlation co-efficient is statistically different from zero. A p value $\leq$ 0.05 signifies that there exists significant correlation between the ranks. Spearman's rank correlation was employed to find out whether there is correlation between the ranking of the source of awareness on soft drinks by the adolescent girls from the three areas and the result is given in Table 3.

Table 3: Correlation matrix of rank given by the adolescent girls with respect to their source of information on soft drinks

Spearman's rank correlation coefficient (ρ)	**Rural** (N=256)	**Coastal** (N=71)
Urban (N=123)	ρ = 0.583 (p=0.099)	ρ = 0.533 (p=0.139)
Rural (N=256)		ρ = 0.933 (p=0.000)

From the rank correlation matrix, in Table 3, it was noted that the ranking given by the urban adolescent girls was entirely different from those of rural and coastal areas since the rank correlation coefficient is not significant (p=0.099 and p=0.139 respectively). However, the adolescent girls from rural and coastal areas had a very high rank correlation coefficient (p=0.000). This results indicates that adolescent girls from rural and coastal areas received their information on soft drinks from similar sources and the sources of information of urban girls were different from their non- urban counterparts.

CONCLUSION

Healthy dietary patterns are a global priority to reduce non- communicable diseases. Soft drink consumption among all age groups has increased. This should be effectively put under check

especially among the adolescent girl population as they are the 'soon mothers- to- be' whose health would determine the future of the upcoming generations.

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NEEDS AND PREFERENCES OF ANGANWADI WORKERS REGARDING VARIOUS ASPECTS OF INTERIORS OF SELECTED ANGANWADIS

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ABSTRACT

Everyone dreams of simple and safe space for the children to learn at minimum cost which is functional and satisfactory to the inmates of the space, where one can express one's own choice and individuality. Beautiful surroundings constitute the most important factors in the development of visual good taste. An attempt has been made to identify the needs and preferences of Anganwadis as perceived by the Anganwadi worker with regard to the various aspects of interiors of selected Anganwadis. The Interview schedule was used as a tool for background information of Anganwadi workers and their opinion regarding the programme of selected Anganwadis. The respondents were asked to give suggestions for improvement in interiors. Interviews were carried out with regards to list of items which are available or not in the Anganwadis according to children's needs and preferences as perceived by the Anganwadi worker. It included indoor play area and material, outdoor play area and material, teaching /reading material, drawing material, pattern of wall, lighting, colour of the wall, design of curtains, storage space, outside space, furniture, material of furniture, flooring, and soft floor covering.

Keywords: Interiors of Anganwadis, Needs and preferences, Anganwadi Workers,

INTRODUCTION

A place where children play, recreate their own world around them should be well designed to help children's natural instinct to explore the world around them. For this one needs to understand the basic necessities of the children which would help in their development and learning. Designing spaces for children requires an awareness of and sensitivity to the uniqueness of the child as a user within the space. There are both obvious and obscure differences between designing spaces for adults and those for children. One must also provide them with secure surroundings and equipments and play things that meet their needs and support their individual development.

Play is the primary vehicle for learning and development in early years. Since they were born, children begin a marvelous path of development in many dimensions: cognitively, socially,

emotionally and physically (Ruth, 2000). The world of small children in which they grow up, form their ideas and develops their imagination is usually contained within four walls of the nursery and the limits of their domain should accordingly be extended as far as possible (Brandt, 1956). These are achieved only with advance planning, which allows the designer to think about designing style suitable for children and design the spaces so that there's enough storage for materials, visual aids and an activity area. Thus there is a need of a place where the children can spend their initial years and show their own creative ideas.

As a part of the Integrated Women and Child Development Scheme of the Central Government, 'Anganwadi' centers are run in the urban and rural slum areas of the city.

Each Anganwadi has one main care taker and one helper. The educational qualification of caretakers and helpers ranges from Matriculation to graduation. These caretakers are not equipped to provide basic education and training to young children. These Anganwadis generally operate in rented/kuccha structures with inadequate infrastructure and resources.

An Anganwadi is a centre to bring the women and children into the ambit of the improvement of health, education and awareness of their rights through interactive learning, vocational training, basic education, and a sense of safety and security.

While designing the anganwadi components like furniture, lighting, colours, furnishing, accessories, storage, space, ventilation of room should be considered as major factors for making Anganwadis pleasant and conducive place for teaching learning process.

An area needs good selection of colour, texture, pattern, furniture, furnishing which suit to children and selection of all these aspects depend upon functionality, economy, beauty, and individuality which make interiors convenient, pleasant, and cheerful for work (Shukla, 1988).

An important part of this process is consulting the community regarding their needs. Each area will be in a different location, community and will be used for different needs. One should know the interests and favorites of children so it will be easy to replace in the future as their interests and needs change. So one can plan and redesign the Anganwadis which would make the design very special to them.

Generally heat, light, ventilation and acoustics all have an impact on the development of children's health. Since smell is one of the most important indicators of a healthy environment, clean floors and furnishings are of utmost importance. Anganwadis needs an efficient air exchange system, as well as screened, openable windows; soft and natural colors on walls and furnishings; use of natural light, lamps, and full-spectrum lights rather than fluorescent lights. Each room needs a steady flow of fresh air. Acoustical tiles and rugs with pads help to absorb noise. Soft cushions, pillows and back supports for children sitting on the floor help make the environment comfortable.

In India, researchers have concentrated less on needs and preferences of children and Anganwadi worker for Anganwadis. So a need for conducting a study on needs and preferences of Anganwadi workers was felt, with the idea that the study will be useful for Anganwadi workers as it will provide better facilities so they can easily teach the children without any obstruction .The

study will be very useful for families and their children. It will contribute to the field of F.C.R.M and other educational institution in strengthening their knowledge, curriculum and in its application to the practical field. The study will provide feedback to the Anganwadis which is considered as a sample. The suggestions and improved designs developed by the investigator can be used by Anganwadis. This study would be helpful to the government in providing better facilities to the children who go to the Anganwadis in the urban and rural slum areas of Vadodara city. With this background the present study was conceptualized with the following objectives.

Objectives of the Study

- To identify the needs and preferences of Anganwadi workers with regard to various aspects of interiors of selected Anganwadis of Vadodara city

METHODOLOGY

The main purpose of the present investigation was to identify the needs and preferences of Anganwadis as perceived by the Anganwadi workers with regard to the various aspects of interiors in Anganwadis of Vadodara city. Research design of the present study was a descriptive survey in nature. Twenty Anganwadis from different areas of Vadodara city were purposively selected for conducting descriptive survey. They were from different areas of Vadodara city and the willingness of Anganwadi workers was taken into consideration while selecting them as samples. The selected Anganwadi centres were observed by the investigator to gather information on the various activities carried out for the children and to see various components of interiors of the Anganwadis.

The interview schedule was used as a tool with the background information of Anganwadi workers and their opinion regarding the programme. The respondents were asked to give suggestions for improvement in interiors. It dealt with the list of items that were available or not in the Anganwadis according to children's needs and preferences as perceived by the Anganwadi workers. It included indoor as well as outdoor play area and materials, teaching /reading material, drawing material, pattern of wall, lighting, colour of the wall, design of curtains, storage space, outside space, furniture, material of furniture, flooring, and soft floor covering. The data was collected by the researcher herself. Prior permission was taken with the concerned authorities, Anganwadi workers and helpers. Thereafter the data was collected at a time and day convenient to them. The data was analyzed and the descriptive data for each of the Anganwadi was presented. Due to small size of the sample no relational statistics was applied.

RESULTS AND DISCUSSION

Needs and preferences as perceived by Anganwadi workers

List of items generally needed or desired in Anganwadis was given to Anganwadis workers. Each was supposed to respond as to whether these items were present or not present in the Anganwadis. They were further asked to state, if they are not available, then, would they and the children attending Anganwadis like to have them. The information is presented in table. The Anganwadi workers gave their own perception.

1. Indoor and outdoor play material and space

Information of the Anganwadis according to needs and preferences about play items as perceived by Anganwadi workers was gathered .This part describes whether the listed play items were available in the Anganwadis for the children or not. Only those respondents who informed that certain play items were not available were asked to respond as to which items they needed. What they needed is also described in table-1.

Table 1: Information about play items – availability and need

sn	Items	Anganwadis (n=20)							
		Available		Not available		Needed		Not needed	
1.	**Indoor play**	**f**	**%**	**f**	**%**	**f**	**%**	**f**	**%**
	1. Puppets	3	15	17	85	5	25	12	60
	2. Masks	2	10	18	90	6	30	12	60
	3. Rope	7	35	13	65	4	20	9	45
	4. Doll	3	15	17	85	2	10	15	75
	5. Puzzles	0	-	20	100	15	75	5	25
	6. Wooden blocks(all sizes)	0	-	20	100	8	40	12	60
	7. Carrom	2	10	18	90	3	15	15	75
	8. Ludo	4	20	16	80	4	20	12	60
	Outdoor play								
	1. Slide and ladder	0	-	20	100	2	10	18	90
	2. Sea saw	1	5	19	95	6	30	13	65
	3. Tri- cycles	10	50	10	50	10	50	-	-
	4.Ball	10	50	10	50	3	15	7	35

More than three fourth of Anganwadis did not have indoor play items. Three fourth of Anganwadi workers felt a need of puzzles and more than one third of Anganwadi workers needed wooden

blocks as indoor play items in the Anganwadis (Table 1). Nearly one half of the Anganwadis had tri- cycles as outdoor play. More than one third of Anganwadi workers felt a need of" sea saw "for outdoor play in the Anganwadis. None of the Anganwadis had Slides and Ladder for outdoor play of children and 90 % of them desired to have it.

2. Teaching and reading material

This section includes detailed information about the teaching /reading material available at the Anganwadis and used by the Anganwadi workers.

Table 2: Information of the Anganwadis according to need and preferences as perceived by Anganwadi workers about teaching material

Table 2: Information about teaching material					n=20				
Sr.No		Available		Not available		Needed		Not Needed	
2.	Teaching /reading material	f	%	f	%	f	%	f	%
	1. Flannel boards	-	-	20	100	1	5	19	95
	2. Charts	20	100	-	-	-	-	-	-
	3.Matching/ classification cards	-	-	20	100	12	60	8	40
	4. Display boards	1	5	19	95	17	85	3	15
	5. Picture books	2	10	18	90	12	60	6	30
	6. Story books	1	5	19	95	15	75	4	20
	7. Educational charts	10	50	10	50	10	50	-	-
	8.Other extra reading books (dictionary, great personalities etc.	-	-	20	100	15	75	5	25
	9.Slate	3	15	17	85	5	25	12	60
	10. Pen /pencil	11	55	9	45	9	45	-	-
	11. Poetry books	2	10	18	90	15	75	3	15
	12.Poetry cassettes /cd	-	-	20	100	17	75	3	15
	13.Music system	-	-	20	100	2	10	18	95

All the Anganwadis had charts. All the Anganwadis did not have the flannel boards, poetry cd, matching cards, and other reading books and dictionary. There was a need for matching cards, display boards, story books, poetry cassettes in more than three fourth of the anganwadis as perceived by the Anganwadi workers (Table 2).

3. Drawings materials

This part includes the drawings materials available for the children in Anganwadis.

Table 3: Information about need and preferences as perceived by Anganwadi worker regarding drawing material

Table 3: Information about drawing material.									
Sr.No		**Available**		**Not available**		**Needed**		**Not Needed**	
3.	**Drawing materials**	f	%	f	%	f	%	f	%
	1. Crayons	9	45	11	55	8	40	3	15
	2. Colour Pencils	6	30	14	70	10	50	4	20
	3. Erasers	9	45	11	55	11	55	0	0
	4. Drawing book	4	20	16	80	14	70	2	10
	5. Drawing boards	0	0	20	100	12	60	8	40
	6. Drawing Papers	6	30	14	70	8	40	6	30
	7. Scales (ruler)	2	10	18	90	3	15	15	75
	8. White Papers	3	15	17	85	4	20	13	65
	9. Water Colours	1	5	19	95	11	55	8	40
	10. Beads	0	0	20	100	2	10	18	90
	11. Needles	0	0	20	100	4	20	16	80
	12.Threads	4	20	16	80	12	60	4	20
	13.Scissors	5	25	15	75	10	50	5	25

None of the Anganwadis had needles, beads and drawing board, which most of the Anganwadi workers needed. Less than half of the Anganwadis had crayons and erasers. More than three fourth of Anganwadi workers felt a need for drawing books (Table 2). More than one-half of the Anganwadi workers needed drawing boards, threads, scissors, water colours, colour pencils and erasers in the Anganwadis.

4. Colour of wall

This part is about whether the Anganwadis had light and dark colour painted on the wall.

Table 4: Information of the Anganwadis according to need and preferences as perceived by Anganwadi worker about colour of wall.

Table 4: Information about colour of wall. n=20									
Sr.No		**Available**		**Not available**		**Needed**		**Not Needed**	
4.	**Colour of wall**	**f**	**%**	**f**	**%**	**f**	**%**	**f**	**%**
	1.Light colour								
	a. Pink	2	10	18	90	12	60	6	30
	b. Light Green	2	10	18	90	5	25	13	65
	c. Light Blue	4	20	17	85	3	15	14	70
	d. Cream/ off white	3	15	17	85	1	5	16	80
	e. Ivory	3	15	17	85	0	0	17	85
	f. Lavender	1	5	19	95	3	15	16	80
	g. White	2	10	18	90	0	0	18	90
	h. Yellow	1	5	19	95	5	25	14	70

	i.Unfinished brick	2	10	18	90	0	0	18	90
	2. Dark Colour								
	a. Dark orange	0	0	20	100	3	15	17	85
	b. Dark green	0	0	20	100	4	20	16	80
	c. Dark blue	0	0	20	100	8	40	12	60
	d. Brown	0	0	20	100	0	0	20	100

All the Anganwadis had light colours on the walls. The Anganwadi workers preferred some other colour than the existing one to be painted on the walls. None of the Anganwadis had applied dark colours on wall, however some Anganwadi workers wanted dark colour on one of the walls. One half of the Anganwadi workers preferred pink colour on the walls (Table 4).

5. Pattern on the wall

All the Anganwadis had plain walls. No pattern had been used on the walls in any of the Anganwadis.

Table: 5: Information about need and preferences of Anganwadi workers regarding pattern on walls.

Table 5: Information about pattern on walls								**n=20**	
Sr. No		**Present**		**Not Present**		**Needed**		**Not Needed**	
5.	**Pattern on the walls**	**f**	**%**	**f**	**%**	**f**	**%**	**f**	**%**
	1. Floral	0	0	20	100	15	75	5	25
	2. Natural	0	0	20	100	7	35	13	65
	3. Geometrical	0	0	20	100	2	10	18	90
	4. Cartoons	0	0	20	100	18	90	2	10
	5. Nursery	0	0	20	100	16	80	4	20
	6. Scenic	0	0	20	100	9	45	11	55
	7. Textural	0	0	20	100	1	5	19	95
	8. Plain	20	100	0	0	0	0	0	0

More than three fourth of the Anganwadi workers said that they and the children would like to have floral, cartoon and nursery pattern on the wall that would make the room more interesting (Table 5). At present all of them have plain walls.

6. Lighting

General lighting was observed in all the Anganwadis.

Table 6: Information about need and preferences of Anganwadi worker regarding lighting

Table 6: Information about lighting n=20									
Sr. No		Available		Not available		Needed		Not Needed	
6.	Lighting	f	%	f	%	f	%	f	%
	1. Compact Fluorescent Lamp	7	35	13	65	13	65	0	0
	2. Fluorescent tube light	10	50	10	50	8	40	2	10
	3. Incandescent bulb	03		17		0	0	17	

Half of the Anganwadis had fluorescent tube lights. Majority of the Anganwadi workers felt a need of compact fluorescent lamp (CFL) as lighting (Table 6). Three out of 20 Anganwadis had bulbs which they wanted to change to CFL.

7. Design of curtains

Very few of the Anganwadis had curtains in the Anganwadis and they were plain curtains.

Table 7: Information about needs and preferences of Anganwadi workers regarding design of curtains

Table 7: Information about design of curtains n=20									
Sr.No		Available		Not available		Needed		Not Needed	
7.	Design of curtains	f	%	f	%	f	%	f	%
	1.Floral	2	10	18	90	11	55	7	35
	2.Natural	1	5	19	95	15	75	4	20
	3.Cartoons	0	0	20	100	14	70	6	30
	4.Scenic	0	0	20	100	2	10	18	90
	5.Plain	2	10	18	90	2	10	16	80

Very few of the Anganwadis used curtains at all. Those who had it amongst them some had floral and natural design. More than three fourth of Anganwadi workers expressed their desire to have natural and cartoons design in curtains (Table 7).

8. Storage space

The government provides a tin box to keep the material for teaching- learning and various raw food items. Some of them had cupboards to store a few things.

Table 8: Information about need and preferences of Anganwadi worker regarding storage space

Table 8: Information about storage space								n=20	
Sr.No		Available		Not available		Needed		Not Needed	
8.	Storage space for	f	%	f	%	f	%	f	%
	1.Games	2	10	18	90	16	80	2	10
	2.Toys	3	15	17	85	5	25	12	60
	3 .Story books	0	0	20	100	18	90	2	10
	4.Posters and charts	5	25	15	75	14	70	1	5
	5.Drawing materials	3	15	17	85	15	75	2	10
	6.Play material	1	5	19	95	16	80	3	15

Less than one fourth of the Anganwadis had storage space for charts and posters. More than three fourth of Anganwadis needed storage space for toys and games (Table 8).

9. Furniture

This includes information about the furniture, material of furniture and outside space for furniture available at the Anganwadis .

Table 9: Information about need and preferences of Anganwadi worker regarding furniture

Table 9: Information about Furniture								n=20	
Sr.No		Available		Not available		Needed		Not Needed	
9.	Furniture	f	%	f	%	F	%	f	%
	1.Chair	2	10	18	90	14	70	4	20
	2.Table	2	10	18	90	18	90	0	0
	3.Bench	0	0	20	100	0	0	20	100
	Outside space for								
	1.Chair	2	10	18	90	14	70	4	20
	2.Table	2	10	18	90	13	65	5	25
	Material of furniture								
	1.Steel	1	5	19	95	2	10	17	85
	2.Plastic	4	55	16	80	16	80	0	0
	3.Wood	6	30	14	70	5	25	9	45
	4.Cane	0	0	20	100	0	0	20	100

More than three fourth of the Anganwadis had no chairs and tables. Less than one tenth of Anganwadis had chairs made of plastic material having smooth finish. Less than one half of the Anganwadis preferred plastic material for furniture (Table 9).

10. Flooring

This part describes the material of flooring and soft floor covering available in the Anganwadis.

Table 10: Information about needs and preferences of Anganwadi workers regarding flooring

Table 10: Information about flooring		n=20							
Sr.No		Available		Not available		Needed		Not Needed	
10	Material of Flooring	f	%	f	%	f	%	F	%
	1.Cement	2	10	18	90	0	0	18	90
	2.Mosaic	4	20	16	80	14	70	2	10
	3.Kota stone	13	65	7	35	3	15	4	20
	4.Marble	0	0	20	100	14	70	6	30
	5.Ceramic tiles	1	5	19	95	15	75	4	20
	Soft floor covering								
	1. linoleum	0	0	20	100	2	10	18	90
	2. durries	20	100	0	0	0	0	0	0
	3. carpet	6	30	14	70	8	40	6	30
	4. rugs	0	0	20	100	12	60	8	40

Majority of the Anganwadis had Kotastone as flooring and 'durry' used as soft floor covering. More than three fourth of Anganwadi workers preferred mosaic and marble as flooring material and carpet, rugs as soft floor covering (Table 10).

CONCLUSION

From these it was revealed that the indoor play and outdoor play items were found less in the Anganwadis and other needs like teaching materials, drawings materials were insufficient in all the Anganwadis. The researcher had also taken the preferences regarding interior changes where some of the respondents were likely to redesign the Anganwadi to give different look and for also better growth and development. It is suggested that similar studies should be undertaken on a large scale so that overall conditions of Angadwadis can be improved.

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CURRENT CONSUMER PREFERENCES OF ACCESSORIES AS A DÉCOR SOLUTION

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ABSTRACT

Homes help reflect every choice, change and milestone in a person's life. The most essential thing to ultimately feel at home in a beautiful abode is adding one's own personality to the house. Accessories are the most personal part of an interior design that in so many levels make a house a home. The study was taken up with a view to explore the current trends of home accessories and the taste and preferences of individuals in their choice which directly reflect their personalities.

.The methodology adopted for the study consisted of market survey, household survey and case study. The information was collected from 10 popular home décor and furnishing shops to know the availability and recent trends in home and 50 high income households to gather information regarding the preferences of households in selection of decorative accessories for their homes.

A marked majority of 72 per cent of the surveyed households felt that accessories are definitely an important component of home decoration and 68 per cent were keenly interested in accessorizing their home interiors. The selected households had an assorted collection of home accessories. The most universally used group of accessories was Folk art (94 per cent). Ravi Varma paintings were a personal favourite of 8 per cent of the households while Tanjore paintings were also popular in 12 per cent of the surveyed houses. Family photographs were used as an accessory in 70 per cent of the houses. A vast majority of 70 per cent of the houses were fond of diverse varieties of glass accessories.

Accessories are the lifeblood of the home and hence cannot be overlooked or treated as an afterthought- they can really make or break the look and feel of a home.

Keywords: home, accessories, interior, decoration, trends, individuality

INTRODUCTION

"Often times it is the little things that make the biggest impression after all."

"A thing of beauty is a joy forever". Our innate love for beauty permeates every aspect of our lives and influences us consciously and unconsciously in countless ways (Faulkner, 1987). Man has a strong urge to express his creative and aesthetic instincts in visual form. Since his home is the centre of all activities, the inherent instinct for decoration seems to have closely bound up with the structure of the home. The home atmosphere in which we live is an important factor in determining our values and ideas on beauty. This is the place where we develop our sensitivity towards beautiful objects and surroundings that results in good taste (Seetharaman and Pannu, 2007).

Pile(1998) states that the term accessories covers a vast variety of objects usually smaller in scale than furniture that may be introduced into a space to serve a practical purpose, for ornament or display or for some combination of these purposes. In interior design the term accessory refers to an object that acts as a decorative aid to enhance the overall design. A room may be decorated in the best of taste with well-designed furniture, beautiful floor coverings, curtains and upholstery, and have a harmonious colour scheme, but it cannot and never will show individuality or real interest unless it is decorated with tasteful accessories. A house without accessories looks blank and incomplete. Accessories help transform a furnished room into a finished room. Ching (1987) also affirms that accessories in interior design are those items that provide a space with aesthetic enrichment and embellishment. These items provide visual delight for the eye, textural interest for the hand or stimulation for the mind. Ultimately accessories individually or collectively are the inevitable evidence of habitation.

A large variety of accessories are used in a home. They can be classified broadly as functional and decorative accessories. The most common ones are curios, pictures, books, clocks, statues, sculptures, vases, bowls, candle holders, natural objects, fish etc. Some articles like screens, accent furniture, dining table mats and similar items add variety to the kind of accessories used in the home. Some accessories are small decorative objects such as a piece of driftwood, rock crystal or seashells. Potted plants, flower arrangements of leaves and branches or dried natural forms are also used in accessory roles. Functional accessories usually serve a specific purpose or need. Examples include clocks, mirrors, pillows, vases, ashtrays, desk equipment, lamps, books, bowls of fruit etc. These are practical accessories that should be considered in relation to the particular functions of each space in which they will be placed. Decorative accessories are those with are chosen for their beauty alone like works of art, paintings and drawings, antiques, sculpture, photographs, handcrafted items, collections, artificial flowers etc. Sculpture accessories may include many objects such as small marble figurines, wood carvings, ceramic or stone pieces etc. the diversity of these functional and decorative objects are seen in the materials of which they are made. Ceramic is one of the most commonly used materials. Pottery and earthenware are made from coarse clays. Porcelain is the finest ceramic. Different kinds of stones ranging from highly polished marble to rough cut fieldstone are used in a variety of forms. Apart from these, granite, sandstone, slate, limestone, and some rarer stones contribute their distinctive textures and colours. Silver, pewter, gold, bronze, brass, copper, steel, aluminium, and iron are used alone and in combination with other materials. Wood and leather accessories have their own special qualities. Glass and plastic accessories have certain qualities in common: both can be transparent or translucent, plain or coloured and shiny or matte finished. Also in the category of decorative objects are collections that can be exhibited in a visually attractive way and include such things as travel mementos and sentimental treasures. Decorative accessories help to set a mood and to make a statement. There are a number of other things in our environments that are products of rapidly developing and constantly changing technology. Appliances, computers, video systems, audio systems and telephones are important elements of an interior. They are primarily chosen for their function although they may be good design as well. They should be considered an important part of the design and be accommodated with sensitivity to their function and aesthetic appeal (Nielson and Taylor, 2002).

A home is more than a physical structure of wood or stone; it is a spiritual temple where one's true self inner beauty and soul can feel at home. The current trend, is not about perfect

symmetry or perfectly matching decor but is more about expressing one's own unique individuality. The present generation has the ability to recognise, acquire and put together an ideal collection of unique, hand-picked objects (furniture, artefacts, art, knick-knacks, furnishings etc.) that reflect one's personal style, taste and hence social status. Subtle yet classy personal touches not only enhance the home interior but speak volumes about one's actual personality, profession and position in society (Times of India, 2014).

Accessories are often considered as incidentals and almost added as an afterthought. Their importance in home décor is mostly overlooked. With a keen interest in the field of Interior Design, the study on "**Current Consumer Preferences of Accessories as a Décor Solution"** was undertaken to

- obtain information on the recent trends in accessories available in the market
- study the role of accessories as a decorative element in residential interiors
- analyse the attitude and preference of consumers in the choice of accessories
- identify exquisite accessories reflecting the individuality of the households

METHODOLOGY

Coimbatore also known as Kovai is the third largest city in Tamil Nadu with a population of 3,458,045 (www.census2011.co.in). It is situated in the extreme west of Tamil Nadu, near the state of Kerala on the banks of river Noyyal. Cosmopolitan culture, pleasant salubrious climate all year round, good connectivity and rapid infrastructural growth make it an ideal destination for setting up homes. Modernisation and Urban lifestyle have given a high standard of living to the people in Coimbatore. An increase in trend of luxury living has led to an influx of high end projects, luxury brands and cutting edge designs. There are many home décor and furnishing stores spread across the city. In phase one, a market survey was conducted on ten popular shops for home furnishings and accessories which were selected based on purposive sampling method. Ten shops namely Home Centre, Aavishkar, and Artful Homes in Brooksfield mall, Silver Springs, Beaux Homes, @Home and Lakshmi Home Style Furniture in R.S Puram, Teak Homes in North Coimbatore, Furncoms in Crosscut Road, Poompuhar in Town Hall and Desi Haus in Trichi Road were selected.

In the second phase, a household survey was conducted on 50 high income households to gather information regarding the preferences of households in selection of decorative accessories for their homes. Areas namely R. S. Puram, Krishna colony, Saibaba colony, Race Course, A.T.T colony, Gandhipuram were selected for the study in the city because all these areas are developing with a huge population of high income groups. An interview schedule was developed for conducting the survey. Observation along with direct personal interview carried out by the investigator at each of the selected houses proved instrumental in gaining significant information related to the study. Once all the data was collected, the investigator examined the significant details of exclusive accessories and its relation to the owner's personal taste and individuality.

RESULTS AND DISCUSSION

Highlights of the Market Survey

A vast majority of 70 per cent of the surveyed shops selected accessories on the basis of the current trends in the market and customer demand.. A majority of 60 per cent of the shops were selling imported products and only a minor 10 per cent of the shops sold locally manufactured products. All the selected shops traded in a wide collection of home accessories (Plate-1) among which sculpture and wall art were available in all the ten shops, and accessories like clocks and accent furniture was available in 80 per cent of the shops. Natural objects and customised accessories were available only in 20 per cent of the shops. Fig.-1 depicts the availability of accessories in selected shops.

Fig 1: Availability of Accessories in Selected shops

The materials used for accessories varied among shops. In a majority of 40 per cent of the shops wall accessories like wall clocks and photo frames were made of plastic. Among floor accessories like large pots and vases, ceramic was the common material used and glass for table top/ shelf accessories like bowls in 40 per cent of the shops each. Glass was also used in 30 per cent of the shops for ceiling/ hanging accessories like chandeliers and lanterns. A majority of furniture accents in 20 per cent of the shops were made in wood. Eighty per cent of the customers were well informed and confident of selections whereas 20 per cent of the customers lacked knowledge in home accessorizing and accepted suggestions. In a majority of 60 per cent of the shops, customers preferred modern and contemporary home accessories keeping up with current trends.

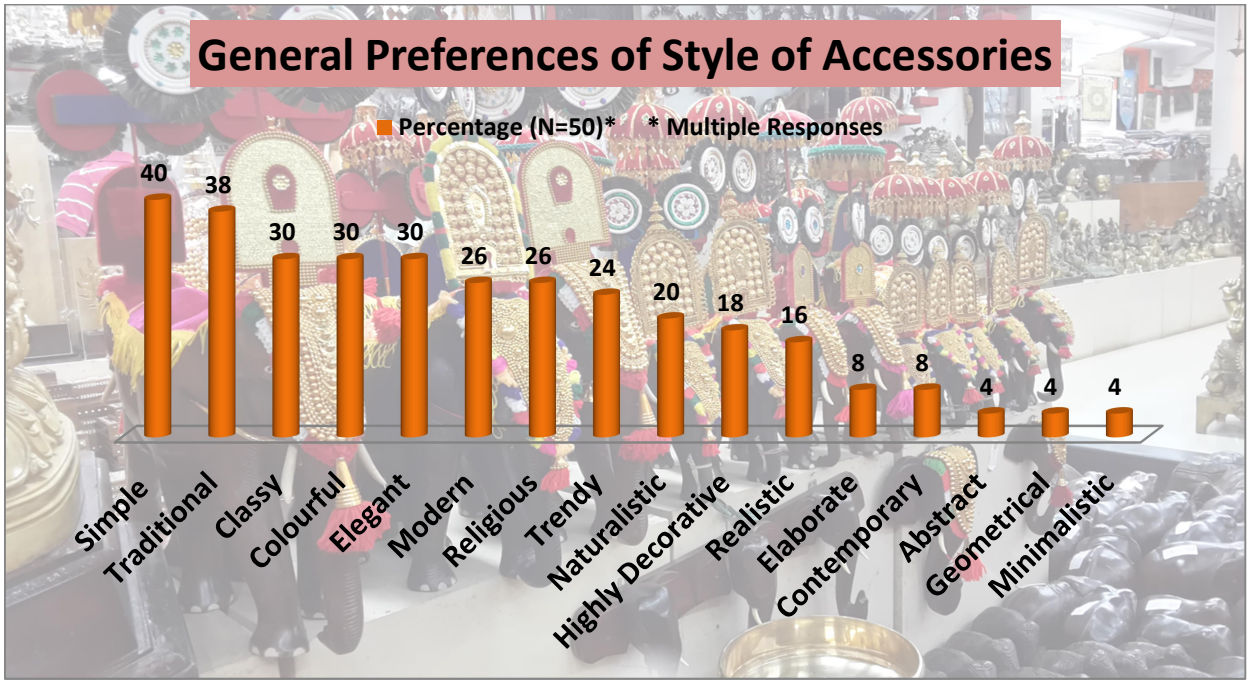
Highlights of the Household Survey

A marked majority of 72 per cent of the surveyed households felt that accessories are definitely an important component of home decoration and 68 per cent were keenly interested in

accessorizing their home interiors. Fifty eight per cent of the households had not purchased any accessories from other countries, whereas 42 per cent had a display of several accessories purchased during trips to various countries across the world. A majority of 54 per cent of the surveyed households have confessed that they do not pay attention to changing trends in the use of home accessories. However, 46 per cent of the households have affirmed that they do update their home accessories according to the latest trends. A vast majority of 72 per cent of the households believe that their own individuality is expressed through the accessories in their home while, 28 per cent of the households are of the opposite opinion

Plate 1: Home Accessories in Selected Home Décor shops

The preferences in the style of accessories varied significantly between different households. A vast majority of 40 per cent of the households voted for simple accessories and 38 per cent had a liking towards traditional accessories. Thirty per cent of the households favoured classy and colourful accessories each and 26 per cent each preferred modern and religious accessories as shown in Fig.-2.



Fi 2: General Preferences of Style of Accessories

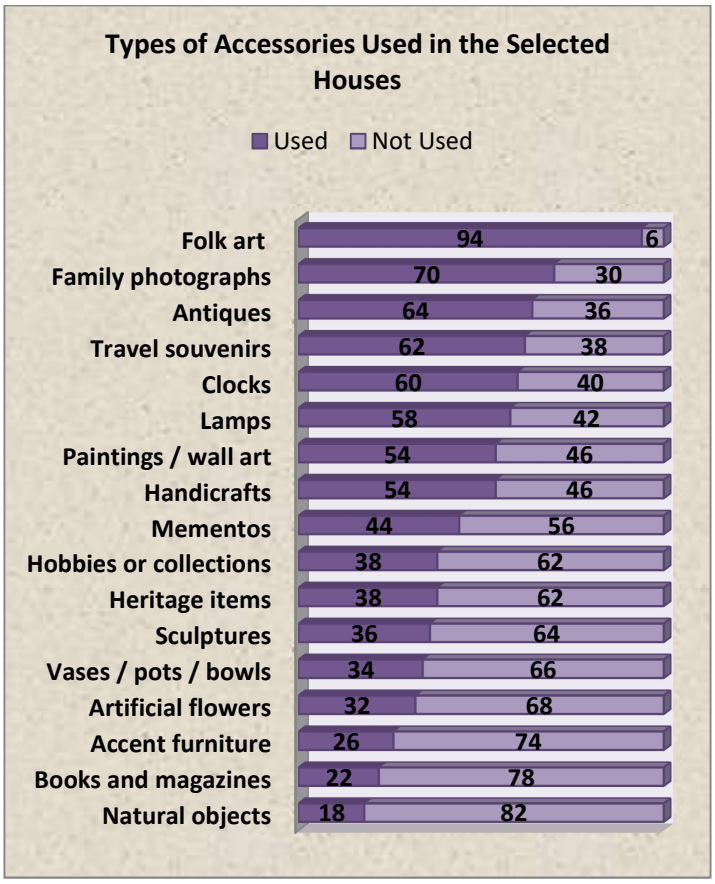


Fig 3: Types of Accessories Used in Selected Households

The selected households had an assorted collection of home accessories as shown in Figure 3. The most universally used group of accessories was Folk art (94 per cent) and the most frugally used were natural objects like shells, rocks and pebbles. Family photographs were used as an accessory in 70 per cent of the houses as seen in Fig.-3.

There were very limited resemblances in the use of accessories in surveyed households as clearly revealed in the above table. The data reiterates that accessories vary according to the individuality of each family.

Clocks: Clocks are both functional and decorative and is one of the most necessary accessories in a house. A majority of 64 per cent of the households used clocks in their Living rooms. It was fascinating to discover that six per cent of the households even possessed Cuckoo clocks one of which was in fact an original mechanical Cuckoo clock from Germany that was worth Rs. 45,000 (Plate-2)

Plate 2: A German Cuckoo Clock

Family Photographs: A majority of 40 per cent of the households displayed family photographs in the Living room itself. These photographs most commonly consisted of a single professional photograph of the whole family placed on a large wall or smaller photo frames of children and grandchildren placed on side tables or shelves. Plate-3 shows a Family tree photograph arrangement and a collage of memorable moments captured in a photograph as observed in the households

Religious: Due to the majority of Hindu households, religious accessories were displayed throughout the rooms of the house, with a maximum of 18 per cent of puja articles within the puja room itself, whereas a maximum of 30 per cent of the other religious accessories were positioned in the main living room. Among the religious idols, the most beloved one was that of lord Ganesha which was placed at the entrance of the house as well as in other rooms.

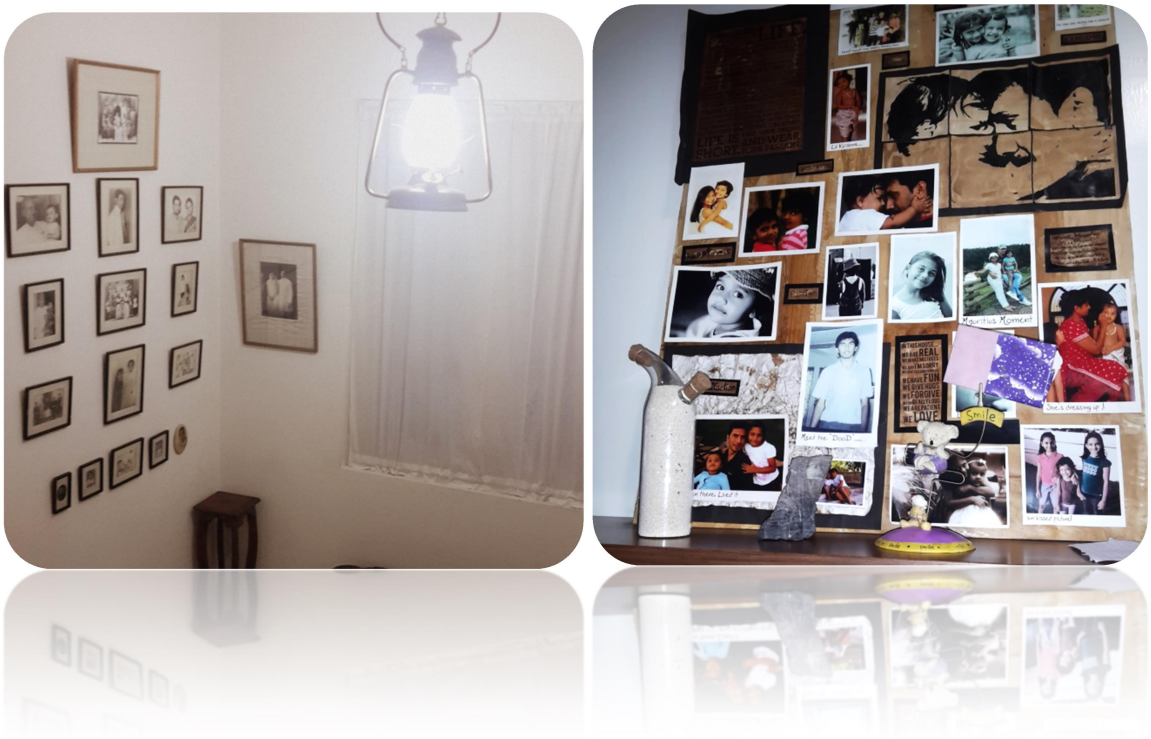


Plate 3: Examples of Family Photographs displayed in Selected Households

Collections: Households proudly displayed their collections of many years. Among collections the most popular one was Travel souvenirs which a majority of 28 per cent of the households displayed in their Living room, whereas a small four per cent of households continued the display of their souvenirs in the family room as well. It was also exciting to discover original Swarovski crystals among six per cent of the households(Plate-4)

Plate 4: Crystal Collection including Swarovski Crystals

Sculpture: Sculpture was used in several forms in the surveyed houses. Animal sculptures were favoured over other figurines. Among them the most striking resemblance between households was the presence of elephant sculpture which was present in a majority of 20 per cent of the houses.

These ranged in different sizes and materials such as terracotta, sandalwood, mahogany, marble etc.

Lights: It was intriguing to observe that the households in Coimbatore gave prominence to many decorative lighting fixtures in their houses ranging from huge chandeliers, colourful LED lights to hanging lanterns and decorative lamps. Among these 22 per cent of the houses bore a resemblance to their use of chandeliers for the living, dining and family rooms. These lighting fixtures facilitated the highlighting of the other important accessories in each room.

Paintings: Ravi Varma paintings were a personal favourite of 8 per cent of the households and they displayed these in a grouping of three or four along the staircase walls . Tanjore paintings were also popular in 12 per cent of the surveyed houses. A maximum of 26 per cent of the households were seen to display paintings in their Living room, while paintings were also present in other areas of the house.

Natural objects: Natural objects like rocks, pebbles, shells etc. were noticed in some houses, nonetheless the most common one was the display of real peacock feathers in 10 per cent of the houses.

Functional Accessories: Though less attractive and significant than decorative accessories, these minor accessories cannot be overlooked in a completed interior. Among the various functional accessories identified in the surveyed houses were key holders, bells, tea coasters, placemats, wooden boxes, scented candles, fruit bowls, calendars, magazine holders, cloak hangers and ash trays. These accessories were used more in the living (24 per cent) and dining (18 per cent) rooms.

Buddha: The Buddha statue is famous for its cheerful and calm demeanour and is available in many sizes, materials and postures. The laughing Buddha was displayed in 14 per cent of the houses and was placed in the living room by all of them (Plate- 5).

Plate 5: Examples of Buddha sculptures displayed in the Selected Households

Each household showed diversity in the placement of accessories as shown in Fig.- 4. A vast majority of 68 per cent had accessories that were suspended from the ceiling. Accessories were also placed on centre tables, corner stands and console tables. A small eight per cent of the

houses used niches with accent lighting to place single objects. Heavy and tall accessories were placed on the floors by 34 per cent of the households. The living room consisted of the maximum number of accessories in a vast majority of 78 per cent of the houses, which was followed by the Family living room in 10 per cent of the houses.

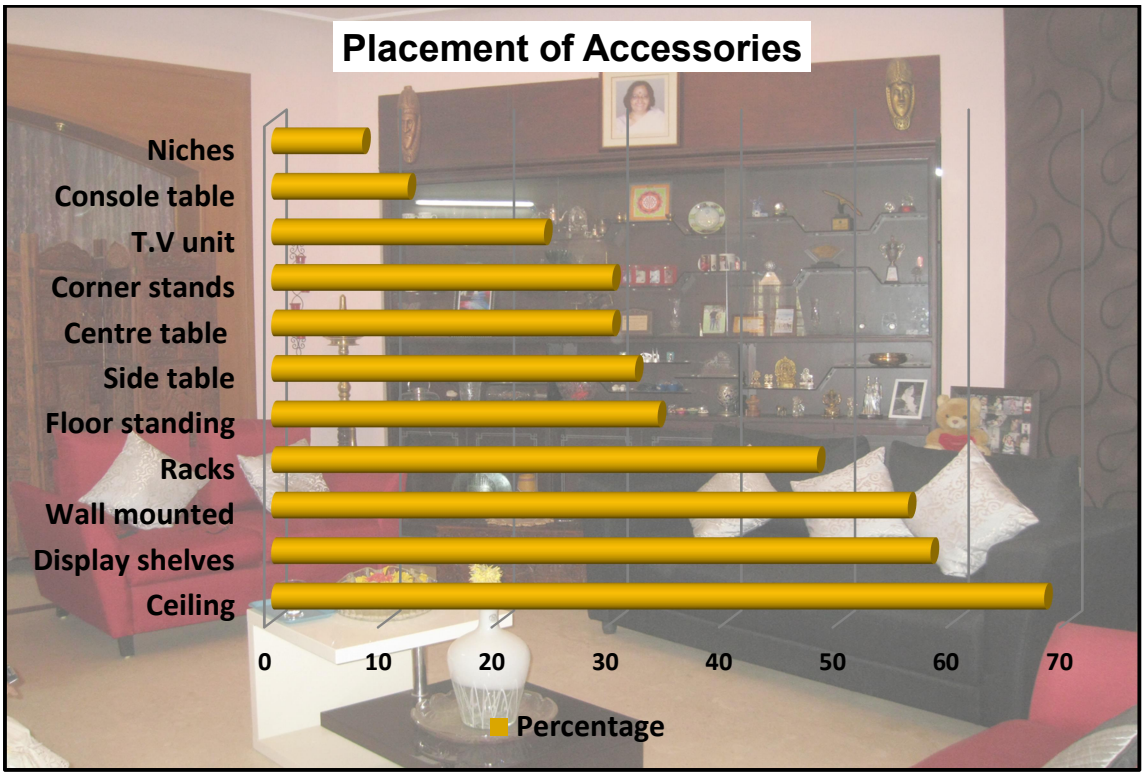


Fig 4: Placement of Accessories

The investigator used her knowledge and skills to make an overall assessment of the use of accessories during her visit to each of the surveyed houses. The facts observed and evaluated by the investigator are recorded in Table-1. The investigator was pleased to observe that more than half of the surveyed households naturally possessed a good taste in the choice of accessories for their homes. The principles of design are very essential to achieve a pleasing appearance when accessories are arranged. Only 48 per cent observed these basic principles such as balance, harmony, rhythm and proportion in the arrangement of accessories. It was regretful to find that in as many of 46 per cent of the houses accessories were not maintained well. Fifty four per cent of the households did not provide adequate spacing for the groupings of accessories which led to a cluttered appearance.

Table 1: An Overall Assessment of the Use of Accessories

S.No.	Particulars	Percentage	
		Yes	No
1.	Good taste in selection of accessories	**54**	**46**
2.	Principles of design in arrangement and placement of accessories	**48**	**52**
3.	Good condition and maintenance of accessories	**54**	**46**
4.	Unnecessary accessories	**34**	**66**
5.	Overall pleasing appearance	**68**	**32**
6.	Adequate spacing of accessories	**46**	**54**
7.	Presence of exquisite pieces of art	**32**	**68**

CONCLUSION

"A home should be a distillation of your interests, of who you really are. If you're happy with your life, your space will reflect that."

-Designer Rafael de Cardenas

The essence of Interior Design will always be about people and how they live. It is about the realities of what makes for an attractive meaningful environment, not about trends that emerge and fade away. Decorating should not be to impress, but to add life to the rooms in houses. Accessories are the lifeblood of the home and hence cannot be overlooked or treated as an afterthought- they can really make or break the look and feel of a home. They are the little details that truly make a home shine. So the current trend advises us, "Don't make your home décor imitate the physical tastes of what others consider pretty. Let it reflect you! "

"It doesn't matter if your taste is Modern or traditional, classic or retro. An honest home is always up to date."

- Cameron Kimber, interior designer

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I, Prof. Maneesha Shukul, hereby declare that the particulars given above are true to the best of my knowledge and belief.

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