Classification Models and Hybrid Feature Selection Method to Improve Crop Performance

U.Muthaiah, S.Markkandeyan, Y.Seetha

Abstract— In this paper classification models and hybrid feature selection methods are implanted on benchmark dataset on the Mango and Maize. Particle Swarm Optimization–Support Vector Machine (PSO-SVM) classification algorithm for the selection of important features from the Mango and Maize datasets to analysis and also compare with the novel classification techniques. Various experiments conducted on these datasets, provide more generated rules and high selection of features using PSO-SVM algorithm and Fuzzy Decision Tree. The proposed method yield high accuracy output as compared to the existing methods with minimum Error Rate and Maximum Positive Rate.

Keywords: Classification, Feature selection, PSO-SVM, Decision Tree

I. INTRODUCTION

Starvation is forcing people to cultivate land that is inappropriate for agriculture and which can only be converted to agricultural use through more pains and costs. Every nation is known for its core competence. Agriculture[4] is main source for indian people. Still, it only accounts for 18 per cent of the total is Domestic Product. Due to urbanization, it is going to be a big challenge to yield food for more people with a smaller amount of land and water. The present research primarily on to improve the crop productivity by considering climate change and landscapes. Agricultural area comprises with spatial inconsistency in weather, soil type, and topography.

Agriculture productions makes impact on overall economic and social wellbeing n India. Farmers are backbone of any country economy, because of a large population lives in rural locations and it is directly or indirectly dependent on agriculture for a living. Main source of income comes from farming forms for the farming community.

The requirements for harvesting crop are sufficient water and funds to buy seeds, pesticides, fertilizers, labor etc. The farmers mostly manage the required funds by compromising on other required expenses, and if it is still insufficient they resort to credit from sources such as banks and private financial.

In india, Mango is cultivated in kharif and Rabi sessions. Mango is one of the most cultivated grain crop in India and in Asian counteris. South India consumes more mango than any part of india. Agriculture is the main profession of about 62 per cent of the people in Tamil nadu. Mango is major food of state about 77 per cent of food grain production. Always payment is dependent on the success of the crop. When the crop fails due to several factors, like improper, bad weather pattern, soil type, excessive and premature application of manures, insecticides, adulterated seeds and pesticides etc. The Maize productions also have not kept pace with demand n the recent year. The Maize in india is the third most important food grains after rice and wheat. It is cultivated mainly in kharif sessions and contributes 100 million to agricultural GDP at current prices. Maize can be grown in variety of soils ranging from loamy sand to clay sand.

The farmers are dealing with seasonal variability in short term is very crucial. The relevance and quality agricultural dataset is vital for farmers who requires accurate predictions of crop yield to help make strategic decisions [1]. The combination of Principal Component Analysis (PCA) is for preprocessing and a modified Genetic Algorithm (GA) is used to get crop yield. By reducing number of features, computational cost and time would be reduced [5], [6]. In such way, the classification models for agricultural corps can be efficient and characterization is also improved. The PCA-GA data mining mechanism will be applied for agricultural crops dataset to classify key attribute combinations and characteristics that determine crop performance.The high resolution spatial simulations have been performed by incorporating high resolution datasets with agro ecosystem models. The climate change over an agricultural landscape which describes the Impact on crop productivity and Impact on Soil organic carbon due to combined effect of soil erosion and climate change [2].Datamining techniques[10] like Classification and prediction are very important tasks to find the useful information in order to help farmers by using agricultural datasets. Variety approaches were implemented to build classification and prediction models, including the support vector machines (SVM). Feature subset selection plays important role n building classification systems.

When reduce the number of input features in a classifier produce a good predictive and less computationally intensive model [2]. By selecting

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appropriate feature subset, classification process can be realized easier. The appropriate parameter setting can improve the SVM classification accuracy. For designing SVM, must select a kernel function, set the kernel parameters and determine a soft margin constant C. Therefore, SVM classifier based on PSO s applied to produce better results by comparing with the existing methodologies. SVM takes set of nput data and predicts, two possible classes comprises the nput, making the SVM a non probabilistic binary classifier. The linear separating hyper plane s found by maximizing the margin between two classes n this space[9]. Therefore, the complexity of the separating hyper plane depends on the nature and the properties of the used kernel. in this paper, the following sections are organized. Second Section explains the Literature survey. Third Section explains proposed methodologies. Fourth Section explains the results and discussion finally.

II. RELATED WORK

Author [3] proposed an expert data mining techniques depends on PCA-Genetic Algorithm, t has applied to describe crops n agricultural field. The technique exemplifies the progresses to classification difficulties by applying preprocessing method called Principal Components Analysis and a improved Genetic Algorithm optimize the process. The fitness process n GA was revised for that reason by means of well-organized distance measures. The PCA and Genetic algorithm mixed data mining method, using different data sets related agricultural filed, creating data mining classification models and create relationships understandable. The outcomes from experiments give an idea about enhanced classification results and produced representations for the corps n agricultural field. The outcome based domain model can give benefits to researchers and farmers n the agricultural filed. The produced classification patterns may also be demoralized and with desire have as a featured into a decision support system[11]. The experiments produced the results by the PCA-Genetic Algorithm was good and enhancing the data mining process and also producing classification models and procedures for agricultural crops characterization. The identified attributes would optimization characteristics of the Genetic Algorithm during the process..

In this paper the author [8] was used as a tool of data mining for doing approximation n crop yield. The study of new data mining methods an The study made assessed new data mining methods and it was implemented to variety of attributes to create when we found new meaningful relations . The efficient data mining methods can be implemented and assesed using suitable data to resolve larger agricultural problems.

It is used to reduce dimensionality without losing correctness. The pca is implemented to find sparse data and creating improved association rules. It is a multivariate methods that produce the data table with observations are described by nter correlated dependent variables. This method aims s transform the data nto new orthogonal variables which s a principal components[9].

The EPIC method s used to model the climate change impact by the responsive way. Discussed about Carbon dioxide enhancement, management and crop relations. This paper discussed about discussed about efficient algorithm for classification of multiple classes. Better understanding of soil nature could improve yield n farming, biodiversity, reduce fertilizers and better soil management system for private and public sector Final paper s prepared as per journal the template Contents of the paper are fine and satisfactory. Author (s) can make rectification in the final paper but after the final submission to the journal, rectification s not possible. ANN, ID3, the k- means, and the k-NN [11] and support vector machines applied n the agriculture filed for classification. Production scheduling is important n preparing supply chain management. Marketing task would be used to crop production evaluations.

III. PROPOSED METHODS

Mango dataset s taken as training set for the process. In PSO, a particle considered as each solution of the optimization problems. It is a current vaiable (Ppbest(s)) and good positions (Pgbest(s)). PSO is locate the position and velocity as follows

$$Vide\ (s+1) = WVi\ (s) + a1 * q1 * (P_p best\ (s)\ Xide\ (s)) + g1 \quad (1)$$

$$g1 = a2 * q2 * (P_g best\ (s) - Xide\ (s)) \quad (2)$$

$$Xi\ (s+1) = Xide\ (s) + Vide\ (s)$$

Where = 1, 2, ...*N, and d* = 1, 2,...*D*, It s referred the dimension of solution space. The (1) and (2) equations, the factors *a*1 and *a*2 are larger constants, random numbers are q1 and q2 uniformly distributed the interval [0, 1], *Vide* ∈ Vminimum, Vmaximum], where Vminimum and Vmaximum for maximum velocity to optimize the process. It is to regulate PSO and avoid growing fast. w s parameter for inertia weight to balance the global and local search abilities. Use PSO-SVM Algorithm for the Selection of important features.

IV. RESULT AND DISCUSSION

The Table 1 shown below s the analysis and comparison of different methods, implemented for doing classification on Maize and Mango datasets. The Existing Methodology implemented by using PCA-GA to select the feature and classifier used for the classification, which can be a final decision. But here, a more improved PSO-SVM based Feature Selection method if it is used for selecting the features from that dataset and then Fuzzy Based Decision Tree is implemented as classifier for doing classification on dataset.Authors should consider the following points:

The Methods when implemented on Various

Datasets on Various Techniques it is concluded that the proposed methodology outperforms with more accuracy as compared to other previous methodologies.

The table 1. shown below is the analysis and comparison of different techniques implemented for the classification of Maize and Mango Datasets. The Existing methodology implemented uses PCA-GA for selecting feature and classifier is used for the classification of final decision. But here a more improved PSO-SVM based feature selection method is applied to get accurate results to optimize the performance.

Table 1. Comparison of Accuracy of Various Techniques

Classifier	Maize	Mango
k-NN	99.87	99.87
J4.8	99.66	98.90
Naïve Bayes	92.53	97.22
MLP	98.82	99.95
Proposed (PSO-SVM)	99.95	99.93

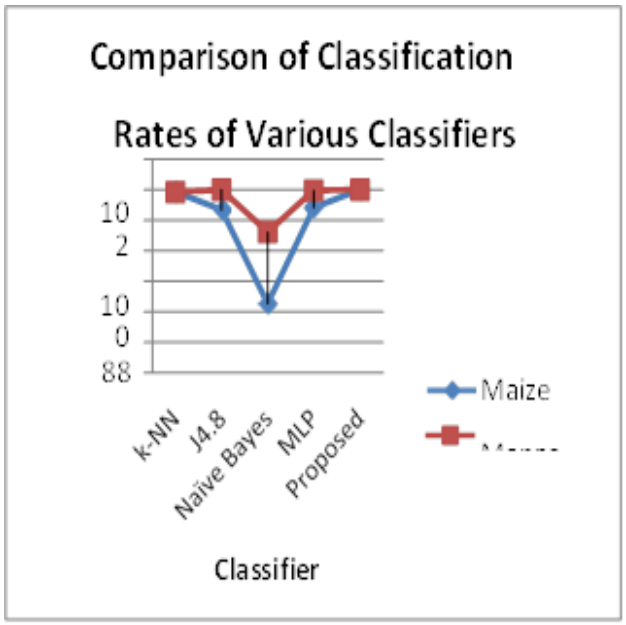

Figure 1. Analysis of Accuracy on Various Dataset

The table below shown the number of reduced features comparison with SVM without PSO and with PSO. In this process, the proposed methods s working good to select suitable features.

MapReduce Based Classification: Mapper function and Reduce function are used. First the mapper method is used to process line by line. This method is processing the dataset and generating many small chunks of data. key/value pair is used for generating ntermediate key/value. Reduce stage is a combination of the shuffling and merging s done n reduce stage. The reduce phase is merging the same key intermediate values. Finally, the output is stored in HDFS (Hadoop Distributed File System).

Table 2. PSO- SVM on Maize Dataset

Algorithms	Original Set of Features	Reduced Features subset	Accuracy (%)
Without PSO-SVM	**30**	**-**	**80.50**
With PSO-SVM	**30**	**6**	**99.95**

Table 3. PSO - SVM approach on Mango Dataset

Algorithms	Original Set of Features	Reduced Features subset	Accuracy (%)
Without PSO-SVM	**22**	**-**	**82.45**
With PSO-SVM	**22**	**4**	**99.93**

Table 4. Various Feature reduction approach for Dataset

Datasets	PCA-GA	k-NN GA	J4.8-GA	Naïve Bayes-GA	Proposed PSO-SVM
Maize	**58**	**4**	**21**	**17**	**2**
Mango	**41**	**5**	**18**	**26**	**1**

V. CONCLUSION

The result analysis shows the proposed method performance. The proposed method applied to provide more accuracy for the classification using Maize and Mango Datasets. IAS IA result of experiments conducted, the proposed method obtained accuracy rate of 99.95% IBY more generated rules and high selection of features. The proposed method also provides less Error Rate and High Positive Rate. Although the methodology applied here provides efficient results as compared to the other existing techniques, but further enhancements can be done related to the computational time of the methodology as well as reducing the rules generated.

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Research Article

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A New Method of Estimating the Process Capability Index with Exponential Distribution Using Interval Estimate of the Parameter

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Abstract: This paper deals with a new method of deriving the Process Capability Index (PCI) when the quality characteristic X follows a positively skewed distribution. The focus of the paper is to derive a new estimate of PCI by taking into account the $100(1-\alpha)\,\%$ Confidence Intervals (CI) of the parameter (s) and arriving at a new expression. The formula C_s, proposed by Wright (1995) which contains a component for skewness, is reexamined and a new estimate is constructed by utilizing the lower, middle and upper values of the CI of the parameter. The weighted average of the *three* possible estimates of C_s is proposed as the new estimate by taking the weights inversely proportional to the squared deviation from the hypothetical value of C_s. The properties of the estimate are studied by simulation using one parameter exponential distribution.

Keywords: Exponential Distribution, Confidence Intervals, Process Capability Index

MSC 2010: 62P30

1 Introduction

Let $F(x)$ be the probability distribution function of a process characteristic, e.g., task completion time with mean μ and standard deviation σ. One of the measures of process performance is the Process Capability Index (PCI) given by

$$C_p = \frac{\mathrm{USL} - \mathrm{LSL}}{6\sigma}, \tag{1.1}$$

where LSL, USL denote the lower and upper specification limits. It is assumed that the process operates within LSL and USL according to a normal distribution. A simple estimate of C_p is obtained by replacing σ with the sample standard deviation. A discussion on PCI measures can be found in [5].

Vännman [11] proposed a new expression for the PCI by taking into account both the eccentricity and spread, calling it a *super structure* given by

$$C_p(u, v) = \frac{d - u|\mu - M|}{3\sqrt{\sigma^2 + v(\mu - T)^2}}, \tag{1.2}$$

where $d = \frac{\mathrm{USL}-\mathrm{LSL}}{2}$, $M = \frac{\mathrm{USL}+\mathrm{LSL}}{2}$ and $(u, v) \geq 0$ are constants. Note that when $u = v = 0$, (1.2) reduces to (1.1). The formula in (1.2) does not work well for non-normal distributions. Duncan [3] and Montgomery [5] have discussed some data transformations like Box–Cox's or Johnson's method to bring in normality of the data.

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Wright's method [13]. This method makes use of skewness of the distribution to handle non-normality, using the third central moment (μ_3) in addition to μ and σ and given as

$$C_s = \frac{d - |\mu - T|}{3\sqrt{\sigma^2 + (\mu - T)^2 + |\frac{\mu_3}{\sigma}|}}. \tag{1.3}$$

This formula can be used for both skewed and symmetric distributions as well. Pearn and Chang [6] extended the Wright's method to some skewed distributions and found that the bias in the estimate of C_s increases when the skewness increases. A detailed review of various PCI measures can be found in [1].

This paper aims at proposing a new estimate of C_s by utilizing the $100(1-\alpha)\,\%$ Confidence Interval (CI) of the process parameter (s). In essence, we wish to replace the point estimates with *interval estimates* and arrive at a new formula for the PCI.

2 A Novel View of PCI Estimation

Let $\Theta = \{\theta_1, \theta_2, \ldots, \theta_k\}$ be the set of k parameters of $F(x)$, $x = \{x_1, x_2, \ldots, x_n\}$ a random sample of size n from the process and $C = \{C_1, C_2, \ldots, C_m\}$ a set of pre-defined constants unrelated to the process distribution. Define $g(C, \Theta)$ to be a *metric* for the process capability (like PCI). For instance, the classical C_p given in (1.1) has $k = 1$ and $m = 2$ (LSL and ULS), while formula (1.2) has two parameters ($k = 2$) and five constants ($m = 5$). A moment estimator of $g(C, \Theta)$ is $g(C, \hat{\Theta})$, where $\hat{\Theta}$ is the set of point estimates $\hat{\theta}_j$ of θ_j for $j = 1, 2, \ldots, k$.

Koch and Link [4] observed that the single-valued point estimator is very likely to be incorrect in some practical situations and hence an *interval estimator* allowing a range of values is often useful. When the point estimates of process center and spread turn out to be incorrect, the estimate of PCI itself becomes unreliable. J. Sinsomboonthong [10] has addressed issues of constructing CIs using a method calling it *TestSTAT* method. He observed that the coverage probability and the expected length of CI by this method were similar to those obtained by the method of exact CIs.

Remark 2.1. In general, the *interval estimator* of a parameter θ is specified with two *end points* l_x and u_x (both are functions of x) in such way that CI = (l_x, u_x) will have a probability $(1-\alpha)$ of capturing θ.

The quality of the CI is expressed in terms of
(i) coverage probability: $P_\theta = P\{\theta \in (l_x, u_x)\}$,
(ii) width of the interval: $w = (u_x - l_x)$.
The width is estimated as $\mathrm{E}_{\theta(W)}$ over a range of sample intervals. In general, a good CI should have high coverage probability and a small width. An interesting account of CIs, their creation and coverage probability in the case of one parameter exponential distribution can be found in J. Sinsomboonthong [10].

Remark 2.2. The potential benefit of the interval estimate in place of a point estimate is that the former takes into account the dispersion of values within sample and indirectly addresses the problem of precision.

We can summarize the interval estimate of a metric into a single value by taking the weighted average of selected values from the interval. One way is to consider the *lower, middle* and *upper* values of the CI as three possible candidates for θ denoted by the triplet $\{l_x, m_x, u_x\}$, where m_x is the usual point estimate of θ. The end points l_x and u_x will be equidistant around m_x when the underlying distribution is symmetric but not so when the distribution is skewed. If we use the triplet for each of the k parameters and attempt to evaluate the metric $g(C, \Theta)$, we get 3^k possible values. The Vännman's superstructure given in (1.2) produces $3^2 = 9$ possible outcomes, as it has $k = 2$. Similarly, the Wright's formula has $k = 3$ and $g(C, \Theta)$ ends up with $3^3 = 27$ possible outcomes. One way of evaluating the metric is to find all the 3^k possible values and take their convex combination with suitable weights. We call this the *triplet method* of estimation.

The weights can be determined several ways like using a fixed set of values (*a priori weights*) or deriving them from data (*data driven*). Weights can also be theoretical based on the quantiles of the sampling distribution used to generate CI.

Vardhan and Sarma [12] have used the CI method in the context of deriving the area under the ROC curve for binary classification which needs a combination of nine different estimates. They have used *a priori* weights with 0.5 for the middle value and the rest divided equally among the remaining eight values. It is a case of triplet estimates with $k = 2$.

Rani, Sarada and Sarma [8] applied the triplet estimate method and derived a single sampling plan for attribute type of inspection. They have used data driven weights instead of a priori weights. Simulation experiments have shown that the triplet method has lower standard error than the classical method of using the point estimates.

Sarada, Subbarayudu and Sarma [9] used triplet estimation method to estimate PCI of a normally distributed process on the lines of Vännman's formula given in (1.2). They have used weights inversely proportional to the squared deviation from the target PCI.

In the following sections we deal with a non-normal process and apply the triplet estimation in the Wright's formula given in (1.3). A new estimate of C_s is proposed assuming that X follows exponential distribution with parameter θ by using the triplet $\{l_x, m_x, u_x\}$ for θ. We will show by simulation that the new formula has better properties than the PCI obtained with the point estimates of μ and σ.

In Section 3 we briefly review some basic results of exponential distribution. In Section 4 we develop the new estimator and in Section 5 the performance of the new estimator will be discussed with simulated experiments.

3 Interval Estimates of Exponential Parameter

Let X follow exponential distribution with density

$$f(x, \theta) = \begin{cases} \theta e^{-\theta x}, & x \geq 0, \\ 0, & \text{otherwise.} \end{cases}$$

For this distribution

$$\mu = \mathrm{E}[X] = \frac{1}{\theta} \quad \text{and} \quad \sigma^2 = \mathrm{V}[X] = \frac{1}{\theta^2}.$$

The third central moment is $\mu_3 = \frac{2}{\theta^3}$ and the maximum likelihood estimate of the parameter θ is $\hat{\theta} = \frac{1}{\bar{x}}$, where $\bar{x}$ is the sample mean of n observations.

The $100(1 - \alpha)\,\%$ confidence intervals for the mean $\frac{1}{\theta}$ is given by

$$\frac{2n}{\hat{\theta}\chi^2_{1-\frac{\alpha}{2},2n}} < \frac{1}{\theta} < \frac{2n}{\hat{\theta}\chi^2_{\frac{\alpha}{2},2n}}, \tag{3.1}$$

where $\hat{\theta}$ is the point estimator of θ and $\hat{\theta}\chi^2_{1-\frac{\alpha}{2},2n}$ and $\hat{\theta}\chi^2_{\frac{\alpha}{2},2n}$ are the upper and lower percentile points respectively on the Chi Square distribution.

Replacing θ with $\hat{\theta}$ the CI given in (3.1) becomes

$$\frac{2n\bar{x}}{\chi^2_{1-\frac{\alpha}{2},2n}} < \frac{1}{\theta} < \frac{2n\bar{x}}{\chi^2_{\frac{\alpha}{2},2n}}.$$

For instance, let us take a random sample of size 10 from the exponential distribution with $\mu = 2.5$ which means $\theta = 0.4$ and let the sample mean be $\bar{x} = 2.16$ ($\hat{\theta} = 0.46$). Taking $\alpha = 0.05$, the 95 % CI will be $\{1.264, 4.504\}$ and this interval contains the true mean 2.5. Further the width of this interval is $w = 3.240$. Hence the triplet estimate of μ is $\{1.264, 2.160, 4.504\}$. We note that the *right gap* (2.344) from the center is wider than the *left gap* (0.896). Suppose we take of sample of 50 and let the sample remain as 2.16. Then the triplet estimate of μ is $\{1.667, 2.160, 2.901\}$ with width $w = 1.24$. This is a shorter interval than the one obtained with $n = 10$. In this case, the *right gap* is 0.741 and the *left gap* is 0.493. As a rule we may consider larger samples to obtain shorter CIs.

Consider the following illustration.

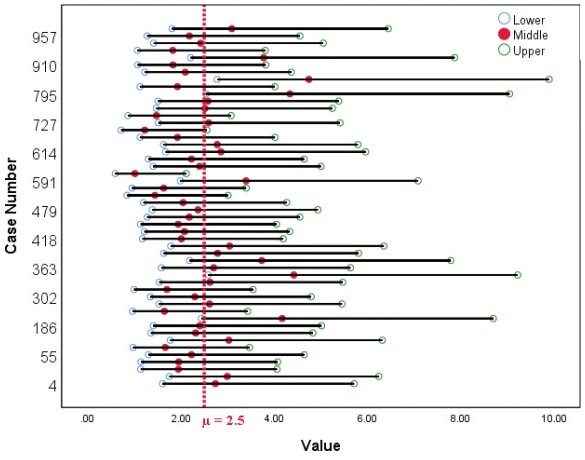

Figure 1: Visualization of CI ($n = 10$).

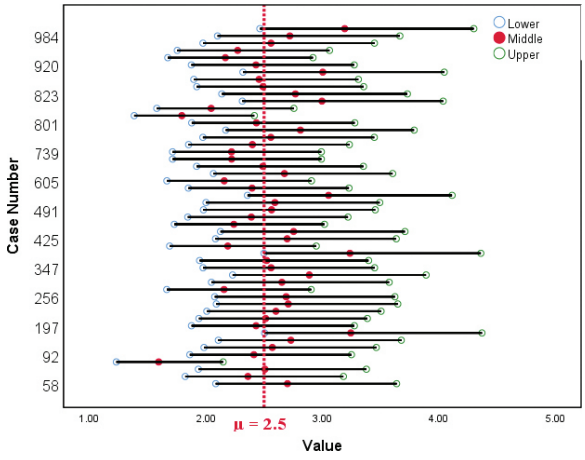

Figure 2: Visualization of CI ($n = 50$).

Example 3.1. Suppose the task time for fixing a mechanical assembly has exponential distribution with mean of 2.5 minutes. Let us simulate 10,000 samples of size $n = 10$ from this distribution. We get 1000 CIs of the form (l_x, u_x) with confidence level 95 %. The coverage probability is estimated to be 0.951 (proportion of samples that contained mean of 2.5). It means that only 4.1 % of cases have missed capturing the true θ. A random sample of 50 out of 1000 cases of simulation is plotted to display the width of each CI as shown in Figure 1. The vertical line shows the target mean and it is easy to see that u_x is far away from m_x when compared to l_x. Figure 2 shows a similar plot with $n = 50$. Long right tails are noticed when $n = 10$ but the pattern is better when $n = 50$. We observe that though each CI can capture θ with 95 % confidence, pattern of lower and upper limits around the central value conveys additional information that can be utilized to improve the quality of the point estimate.

In the light of the discussion above, we proceed in the following section to develop a new estimate of the PCI by utilizing the interval estimates of both μ and σ in the Wright's formula given in (1.3). The moment μ_3 will be replaced with its point estimator $\frac{2}{\hat{\theta}^3}$.

4 New Estimate for C_s

Substituting the point estimate $\hat{\theta}$ for θ in (1.3) we obtain the estimate

$$\hat{C}_s = \frac{d - \left|\frac{1}{\hat{\theta}} - T\right|}{3\sqrt{\left(\frac{1}{\hat{\theta}^2}\right) + \left(\frac{1}{\hat{\theta}} - T\right)^2 + \left|\frac{2}{\hat{\theta}^2}\right|}},$$

where $\hat{\theta} = \frac{1}{\bar{x}}$. Using the CI given in equation (3.1), we get three possible estimates for the parameter θ which are defined below. The triplet of interval estimate $\{l_x, m_x, u_x\}$ leads to $\{\hat{\theta}_1, \hat{\theta}_2, \hat{\theta}_3\}$, where

$$\frac{1}{\hat{\theta}_1} = \frac{2n\bar{x}}{\chi^2_{1-\frac{\alpha}{2},2n}}, \quad \frac{1}{\hat{\theta}_2} = \bar{x}, \quad \frac{1}{\hat{\theta}_3} = \frac{2n\bar{x}}{\chi^2_{\frac{\alpha}{2},2n}}.$$

For each θ_i for $i = 1, 2, 3$ the estimate is

$$C_{si} = \frac{d - \left|\frac{1}{\hat{\theta}_i} - T\right|}{3\sqrt{\frac{3}{\hat{\theta}_i^2} + \left(\frac{1}{\hat{\theta}_i} - T\right)^2}}, \quad i = 1, 2, 3. \tag{4.1}$$

We discuss two approaches of deriving weights viz., (i) based on squared deviation from a given target, and (ii) drawing weights from the probability density function of Chi Square distribution at C_{si} for $i = 1, 2, 3$. In both cases the weights will be normed.

(a) Weights Based on Deviation from Target PCI. Suppose the hypothetical value of θ is given as θ_0 (known). Then the value of C_S can be calculated which, gives the target PCI denoted by T_0 as

$$T_0 = \frac{d - \left|\frac{1}{\theta_0} - T\right|}{3\sqrt{\left(\frac{3}{\theta_0^2}\right) + \left(\frac{1}{\theta_0} - T\right)^2}}.$$

We will combine the three estimates in (4.1) by taking weights inversely proportional to the squared deviation from T_0. We call this *adaptive weight method* since the weights are adopted from the sample data itself. Define $d_i = (C_{si} - T_0)^{-2}$ for $i = 1, 2, 3$ and $w_i = \frac{d_i}{\sum d_i}$, so that $\sum w_i = 1$. It means the weights are inversely proportional to the squared deviation from T_0. By using (4.1), the new estimate becomes

$$C_s^{CI} = w_1 C_{s1} + w_2 C_{s2} + w_3 C_{s3}. \tag{4.2}$$

The value given by C_{s2} is the commonly used point estimate.

(b) Weights Based on Chi Square Distribution. When the target is not specified for the process parameter, it is not possible to use (4.2). Since the confidence limits for θ are based on chi square distribution, we propose the new weights as $v_i = f(\chi^2_{(3)}, C_{si})$ for $i = 1, 2, 3$, where $f(\cdot, \cdot)$ is a certain function. The normed weights can be taken as $b_i = \frac{v_i}{\sum v_i}$, so that $\sum b_i = 1$. The degrees of freedom are taken as 3, since all the three are independent values in the triplet. The new estimate is given by

$$C_s^{CI} = b_1 C_{s1} + b_2 C_{s2} + b_3 C_{s3}. \tag{4.3}$$

For instance, let the values of C_{si} be $\{0.0376, 0.0669, 0.1365\}$ from a sample of size 10. The corresponding ordinates of $\chi^2_{(3)}$ at these three values will be $\{0.0759, 0.0998, 0.1377\}$ so that the vector of weights becomes $\{0.2423, 0.3184, 0.4393\}$. The new estimate works out to 0.0904. We call this *density-based weights method*.

In the following section the model is evaluated by simulated data.

5 Properties of New Estimate – A Simulation Study

Simulated experiments are conducted to evaluate the performance of the new estimator C_s^{CI} with different sample (subgroup) sizes using exponential distribution with $\theta = 0.40$. The other parameters are LSL = 0, USL = 15 and $T = 7.5$. The target PCI expected with these parameters works out to $T_0 = 0.126$. A macro written with SPSS syntax given is used for simulation and data is saved for further analysis. The mean, standard error and bootstrap standard error of C_s^{CI} are obtained from 10,000 simulations run with sample size $n = 10, 20, 30, 50, 100$ for selected values of θ. A sample of 5 records with sample size $n = 50$ and $\theta = 0.4$ has produced the results shown in Table 1.

From the complete experiment, it is found that C_{s2} has mean 0.1247 with standard error 0.00047 while the new estimate C_s^{CI} has mean 0.1255 with standard error 0.00014. It means the new estimate is more consistent than the classical point estimate C_s. A comparison of simulated values is shown in Table 2. The mean and 95 % Bootstrap CI of C_s based on the classical and new estimates of the PCI for different sample sizes and different values of θ are summarized in Table 2. From Table 2 it is clear that the new estimate has shorter CI than the classical estimate.

Sample	Triplet of Means			C_s at the Triplet Values			Weights			C_s^{CI}
	l_x	m_x	u_x	C_{s1}	C_{s2}	C_{s3}	W_1	W_2	W_3	
1	1.4269	1.8488	2.4909	0.0725	0.0949	0.1256	0.0001	0.0002	0.9997	0.1256
2	1.7860	2.3140	3.1176	0.0916	0.1177	0.1494	0.0493	0.8447	0.1060	0.1198
3	1.6493	2.1369	2.8791	0.0844	0.1093	0.1412	0.0680	0.4221	0.5099	0.1239
4	1.6665	2.1591	2.9090	0.0853	0.1104	0.1423	0.0713	0.4837	0.4450	0.1228
5	1.7123	2.2185	2.9890	0.0878	0.1132	0.1451	0.0716	0.6419	0.2865	0.1205

Table 1: Simulated means, triplets, weights and the new estimate (target $T_0 = 0.126$).

Mean (μ)	Parameter (θ)	True PCI	n	Skewness Component	C_{s2} (Classical Estimate)					C_s^{CI} (New Estimate)				
					Mid-point	SE	Bootstrap CI		Width	Mid-point	SE	Bootstrap CI		Width
							Lower	Upper					Lower	Upper
1.0	1.00	0.0409	10	2.0603	0.0482	0.00050	0.0472	0.0492	0.0020	0.0469	0.00016	0.0466	0.0472	0.0006
			20	2.0945	0.0496	0.00037	0.0489	0.0503	0.0014	0.0483	0.00011	0.0481	0.0486	0.0004
			30	2.0741	0.0496	0.00033	0.0490	0.0503	0.0013	0.0487	0.00009	0.0485	0.0488	0.0004
			50	2.0449	0.0497	0.00023	0.0492	0.0501	0.0009	0.0492	0.00007	0.0491	0.0493	0.0003
			100	2.0169	0.0495	0.00016	0.0493	0.0499	0.0006	0.0493	0.00005	0.0492	0.0494	0.0002
1.5	0.67	0.0409	10	4.8076	0.0750	0.00076	0.0735	0.0765	0.0030	0.0730	0.00023	0.0725	0.0734	0.0009
			20	4.7115	0.0762	0.00054	0.0750	0.0772	0.0022	0.0747	0.00016	0.0744	0.0750	0.0006
			30	4.6808	0.0766	0.00046	0.0757	0.0775	0.0018	0.0754	0.00014	0.0751	0.0757	0.0006
			50	4.5975	0.0765	0.00036	0.0757	0.0772	0.0014	0.0756	0.00010	0.0754	0.0758	0.0004
			100	4.5513	0.0765	0.00025	0.0760	0.0770	0.0010	0.0761	0.00007	0.0760	0.0763	0.0003
2.0	0.50	0.1026	10	9.0491	0.1013	0.00095	0.0995	0.1032	0.0037	0.0996	0.00027	0.0991	0.1001	0.0011
			20	8.3292	0.1010	0.00067	0.0997	0.1023	0.0026	0.1010	0.00021	0.1006	0.1014	0.0008
			30	8.0924	0.1009	0.00055	0.0997	0.1019	0.0022	0.1012	0.00016	0.1009	0.1015	0.0006
			50	8.0465	0.1015	0.00043	0.1006	0.1024	0.0018	0.1016	0.00014	0.1014	0.1019	0.0005
			100	8.0278	0.1020	0.00032	0.1014	0.1027	0.0013	0.1022	0.00009	0.1021	0.1024	0.0004
2.5	0.40	0.1260	10	13.5516	0.1202	0.00097	0.1183	0.1222	0.0038	0.1237	0.00031	0.1231	0.1243	0.0012
			20	13.4245	0.1249	0.00071	0.1234	0.1262	0.0028	0.1254	0.00022	0.1249	0.1258	0.0009
			30	12.8886	0.1242	0.00061	0.1231	0.1254	0.0023	0.1251	0.00020	0.1247	0.1255	0.0008
			50	12.6729	0.1247	0.00047	0.1238	0.1256	0.0018	0.1255	0.00014	0.1252	0.1257	0.0005
			100	12.5841	0.1253	0.00033	0.1246	0.1259	0.0013	0.1257	0.00010	0.1255	0.1259	0.0004
3.0	0.33	0.1455	10	19.4157	0.1385	0.00091	0.1367	0.1403	0.0036	0.1444	0.00031	0.1438	0.1450	0.0013
			20	18.8369	0.1417	0.00072	0.1403	0.1431	0.0028	0.1448	0.00021	0.1444	0.1452	0.0008
			30	18.7003	0.1434	0.00057	0.1422	0.1444	0.0022	0.1454	0.00016	0.1451	0.1457	0.0006
			50	18.2012	0.1435	0.00046	0.1426	0.1445	0.0019	0.1453	0.00014	0.1451	0.1456	0.0005
			100	18.1514	0.1446	0.00034	0.1439	0.1452	0.0013	0.1454	0.00010	0.1452	0.1456	0.0004

Table 2: Sensitivity of the classical and new estimates to changes in θ and n.

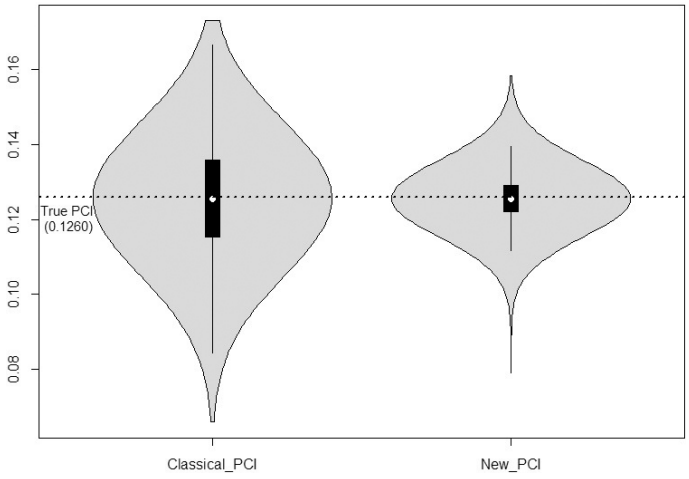

Figure 3: Violin plot of 10,000 simulations of classical and new PCI ($n = 50$, $\theta = 0.4$).

Parameter	Interval Mid-Point	Standard Error	95 % CI
PCI-Classical	0.1255	0.0005	(0.1246, 0.1264)
PCI-Adaptive Weights	0.1256	0.0001	(0.1253, 0.1259)
PCI-Density Based Weights	0.1286	0.0004	(0.1278, 0.1295)

Table 3: Comparative summary C_s^{CI} from 1000 bootstrap simulations (target PCI = 0.1259).

Figure 3 shows a plot of C_{S2} (Classical PCI) and C_s^{CI} (New PCI) with $\theta = 0.4$ obtained from simulated samples of size 50. The violin plots in Figure 3 show that the PCI obtained by utilizing the CIs of the process parameters provides a more stable estimate than the PCI obtained at the point estimates of the process parameters (classical method). We have also studied the new PCI from 10,000 simulations having $n = 50$ and $\theta = 0.4$, with density-based weights using (4.3) and the results are compared with the other methods as shown in Table 3. It can be seen that not much difference exists in the standard error of the estimate between the PCI-Classical and the PCI-Density based method. Therefore, if there is a known target, the adaptive weights method is a better way of utilizing the information from interval estimates of a sample.

6 Conclusions

In this paper we explored PCI values that can be calculated at the three nominal values of the CI and combined them as a weighted average where the weights are adopted from the data itself. We observed that the new estimate of PCI obtained by exploiting the boundary values of the CIs of process parameters are more consistent than those obtained by using the point estimates for the unknown moments. An issue of interest is the method of determining the weights for mixing the different estimates. The method of adaptive weights based on the deviation from a targeted PCI is a good way of estimation. We emphasize that satisfying the unbiasedness property is not always enough and the precision of the point estimate can be utilized to improve the estimate of true parameter effectively.

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On the Estimating the Operating Characteristic of Shewart control chart for Means using Interval estimates of Process mean and Spread

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Abstract

The design of Shewart control chart is based on the point estimates $\hat{\mu}$ and $\hat{\sigma}$ of process mean (μ) and standard deviation (σ), each of which is a single value and the control limits are constructed around $\hat{\mu}$ and $\hat{\sigma}$. An interval estimate takes into account the 'within sample variation' and provides a range of values in the form of a confidence interval. It is possible to utilize the information from the confidence intervals and reexamine the performance of the control chart in terms of the Operating Characteristic (OC). In this paper we discuss a method of converting interval estimates of μ and σ into 'improvised point estimates' and there by achieve a better estimate of the OC. The new estimate will be brought out as a convex combination of 3^2 possible point estimates of the OC. Since the interval estimate reflects sampling variation in addition to location, we claim that 'proper summary of interval estimate' serves as a better point estimate and we call it Improvised Point Estimator (IPE). It is shown by simulated experiments that the new estimator is more consistent than the process OC obtained by using the classical method of point estimates.

Keywords: *Control chart, Interval estimate, point estimate, Operating Characteristic, Process mean, New estimate.*

1. Introduction

Let **X** be a quality characteristic following N (μ, σ^2) where μ and σ represents the mean and Standard deviation of **X** respectively. Shewart (1931) proposed the concept of control chart for Statistical Process Control. A control chart describes the pattern of variation and detects the unusual patterns, if any, in the process parameter. The $\bar{x}$ chart is used to control the process mean basing on m independent samples each of size n, drawn from the process periodically. Let LCL and UCL be the lower and upper control limits that holds a type-I risk (α) of 0.0027. These limits are called 3-sigma limits and the sample means $\bar{x}_i$ are plotted against the sample number (i) for i = 1,2…, m. where m is the number of samples each of size n. If $\bar{x}_i \in (\text{UCL}, \text{LCL})$ for all i, then the process is said to be *under control*, provided the values are randomly spread around the central line (CL) which is set at the mean of the sample means $\bar{\bar{x}}$. When μ and σ are known as μ_0 and σ_0 then the control limits are given by $\mu_0 \pm A\,\sigma_0$ where $A = \frac{3}{\sqrt{n}}$ but in general μand σ are unknown. For the i^{th} sample, μ is estimated by $\bar{x}_i = \frac{\sum_{j=1}^{n} x_{ij}}{n}$ and $R_i = \{\text{Max}_i\,(x_{ij}) - \text{Min}_i\,(x_{ij})\}$ is the process range which will be used to estimate σ.

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The classical estimate of σ is to use $\hat{\sigma} = \frac{\bar{R}}{d_{2,n}}$ where, $\bar{R} = \frac{\sum_{i=1}^{m} R_i}{m}$ and $d_{2,n}$ is a constant whose values are tabulated at different n. The control limits for the R-chart are given as $UCL = D_4 \bar{R}$, CL $= \bar{R}$ and LCL $=$ D3 $\bar{R}$

The constants D_3, D_4 are also tabulated for various values of n and the control limits of $\bar{X}$ chart will be UCL $= \bar{\bar{x}} +$ $A_2\bar{R}$, CL = $\bar{\bar{x}}$ and LCL = $\bar{\bar{x}}$- $A_2\bar{R}$ where $A_2 = \frac{3}{d2\sqrt{n}}$.

In order to control the process mean, it is enough to use $\bar{X}$ chart. When σ is known we need to control the process variation also with the help of R chart (or s-chart). Hence, we set a pair of charts known as ($\bar{X}$,R) charts.

The performance of Shewhart control chart is measured by the type–II risk β, which gives the probability of "accepting the process to be in control" even though there is a shift in the process (false alarm). This measure is treated as the OC of the process. Shifts of larger magnitude will have lower false alarm rate when compared to shifts of smaller magnitude because such shifts are rarely missed. Another measure of assessing the performance of the control chart is the Average Run Length (ARL) which is the number of samples that failed to detect a shift before giving the true alarm. Higher value of ARL indicates poor ability to detect a shift in the process, when it really occurs. Several basic details of control charts can be found in Montgomery (2008), Mittag and Rinne (1993) and E.L. Grant (1964).

In all these charts determination of limits depends on how well the parameters are estimated from sample data. The calculation of OC is a function of the point estimates of μ and σ. An estimate of the OC is obtained by using the moment-estimates in the place of μ and σ.

In this paper we discuss a method of converting interval estimates of μ and σ into 'improvised point estimates' and there by achieve a better estimate of the process OC. Since the interval estimate reflects sampling variation in addition to location, we claim that a *proper summary of interval estimate* serves as a better point estimates and we call it *Improvised Point Estimator* (IPE).

In the following section we review some basics of Interval estimates.

2. A brief review of interval estimation

In statistical inference we come across the problem of estimating a population mean/ percentage/ ratio by using sample data. One way of estimating the unknown parameter θ is to provide a single value t_n which is a function of sample $(x_1, x_2, \ldots, x_n)$. A major portion of statistical methodology is based on this type of estimates called *point estimate.* Sample mean, standard deviation and percentiles are all point estimates of the corresponding population parameters. Estimates are broadly classified as point estimates and interval estimates. Koch and Link (1970) observed that point estimation often gives incorrect information and interval estimates capture reliable information of the parameter.

However, in real life situations point estimates are easy to understood and apply in a context but the accuracy of the point estimate is a matter of concern. For instance, in geological applications, a point estimate of a hilly area can be given in terms of coordinates. If a parachute has to land in that place, the accuracy matters a lot. For this reason, practitioners prefer a range of values instead of a single value as an estimate since such a range gives more information than the single value.

An interval estimate of a parameter θ contains all possible values between two end points $[a_x, b_x]$ which are functions of sample $\{\boldsymbol{x} = (x_1, x_2, \ldots, x_n)\}$. Let $0 \leq \alpha \leq 1$ and (1-α) be the desired confidence with which the interval estimate $[a_x, b_x]$ contain the true parameter θ. This interval is called Confidence Interval (CI) or random interval and $P[\boldsymbol{x} \epsilon [a_x, b_x]]$ depends on the sample *x*. If a number of samples are generated and for each sample the CI of the parameter is worked out then the proportion of samples that contain θ is an empirical estimate of (1-α), also known as the *coverage probability.* The method of estimation and the quality of the data show influence on the coverage probability.

3. Interval estimates of process mean and SD

In the case of normal distribution the100(1-α) % CI of the process mean μ is given by

$$\left[\bar{x} - t_{\alpha/2}\frac{s}{\sqrt{n}}, \bar{x} + t_{\alpha/2}\frac{s}{\sqrt{n}}\right] \quad (1)$$

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where $t_{\alpha/2}$ is the (1-α) % quantile of the Student's t-distribution. If we write L ($\bar{x}$,n) and U($\bar{x}$, n) as the limits of the CI then
P$[L(\bar{x},n) \leq \mu \leq U(\bar{x},n)]$ =(1-α) (2)
The CI of μ_1 is an Interval estimate and the coefficient $t_{\alpha/2}$ is called confidence coefficient which depends on the sampling distribution of $\bar{x}$ and the sample size n. If n is large, we may use normal quantile ($z_{\alpha/2}$) in the place of $t_{\alpha/2}$.
On similar lines an interval estimate of the process spread σ can be obtained from the sample ranges as

$$\left[\frac{\bar{R}}{d_{2,n}}G_1\ ,\ \frac{\bar{R}}{d_{2,n}}G_2\right] \quad (3)$$

where G_1, G_2 are constants and R denotes sample range and $d_{2,n}$ is a scaling constant.(Mittag and Rinne(1993))

In the section 5 we propose a new method of evaluating the OC of $\bar{x}$ chart by utilizing the interval estimates in the place of point estimates. The method of point estimates is discussed below.

4. OC function of $\bar{x}$ chart with point estimates

Let μ_0 be the mean of the process, when the process is in control. Suppose the process mean has undergone a shift to $\mu_1 = \mu_0 + k\sigma$, where k is a constant. The quantity $\left[\frac{\mu_1-\mu_0}{\sigma}\right]$ is called standardized shift and the OC of $\bar{x}$ chart is given by

$\beta = P\{LCL \leq \bar{x} \leq UCL/\mu = \mu_0 + k\sigma\}$ (4)

$$\Rightarrow \Phi\left[\frac{UCL-(\mu_0+k\sigma)}{\sigma/\sqrt{n}}\right] - \left[\frac{LCL-(\mu_0+k\sigma)}{\sigma/\sqrt{n}}\right]$$

$$\Rightarrow \Phi(3-k\sqrt{n}) - \Phi(-3-k\sqrt{n}) \quad (5)$$

The evaluation of β depends on k, which is estimated as $\hat{k} = \frac{\hat{\mu}_1-\hat{\mu}_0}{\hat{\sigma}}$ by using point estimates. For different values of k, the graph of β gives OC curve. As expected, the shape of the OC curve depends on k as well as n.

In the following section we propose a new estimate of β by utilizing the interval estimates of μ and σ.

5. The triplet estimate method of the OC function

The estimation of OC depends on the statistic k = $\left[\frac{\mu_1-\mu_0}{\sigma}\right]$ which takes the form as $\frac{\{\mu_1-\bar{x}\}}{\bar{R}/d_2}$.
Given the CI of a parameter the true value can be anywhere in the CI, by taking the two end points and the middle value of the CI we can obtain a as 3-point estimates of the parameter and call it the *triplet estimate.*

Define $\theta_1 = \frac{\bar{R}}{d_{2,n}}G_1$, $\theta_2 = \frac{\bar{R}}{d_{2,n}}$ and $\theta_3 = \frac{\bar{R}}{d_{2,n}}G_2$.
Then $\tilde{R} = \{\theta_1, \theta_2, \theta_3\}$ is a triplet estimate of R.
Similarly, the triplet estimate for the mean will be $\tilde{\mu} = \{m_1, m_2, m_3\}$
where $m_1 = \bar{x} - t\frac{\bar{R}/d_{2,n}}{\sqrt{n}}$, $m_2 = \bar{x}$, $m_3 = \bar{x} + t\frac{\bar{R}/d_{2,n}}{\sqrt{n}}$
Each of the three components in a triplet estimate is a potential candidate for the true parameter with 100(1-α) % confidence.

Propositon-1: Let O_{ij} be the OC value evaluated at mean m_i and standard deviation θ_j obtained from the triplet estimates defined in (2). Listing these 3^2 values as $O_1, O_2, \ldots, O_9$. A new point estimate will be of the form $O_{new} = \sum_{j=1}^{9} w_j O_j$ where $w_j \geq 0$, $\sum_{j=1}^{9} w_j = 1$ are real numbers.

Proof:

The value of k in relation to the given shift μ_1 can be found at each of the 9 combinations of m_i and θ_i as follows.

$k_1 = \frac{\mu_1 - m_1}{\theta_1}$	$k_4 = \frac{\mu_1 - m_1}{\theta_2}$	$k_7 = \frac{\mu_1 - m_1}{\theta_3}$
$k_2 = \frac{\mu_1 - m_2}{\theta_1}$	$k_5 = \frac{\mu_1 - m_2}{\theta_2}$	$k_8 = \frac{\mu_1 - m_2}{\theta_3}$
$k_3 = \frac{\mu_1 - m_3}{\theta_1}$	$k_6 = \frac{\mu_1 - m_3}{\theta_2}$	$k_9 = \frac{\mu_1 - m_3}{\theta_3}$

Hence the 9 possible OC values using k_i are given by

$O_i = \Phi(3 - k_i\sqrt{n}) - \Phi(-3 - k_i\sqrt{n})$ (6)

The linear combination $\sum_{j=1}^{9} w_j O_j$ is the new estimate. The weights can be either fixed (*apriori*) or derived from sample data.

Hence the proposition.

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6. Selection of Weights

There are different ways of proposing the weights. One way is an adhoc method proposed by Vishnu Vardhan and Sarma (2010), according to which w_i= 0.5 and the remaining weights are $w_j = 0.25\ (i \neq j)$. Another way is to give equal weights $w_i = \frac{1}{9}$ for all i. Both these methods are *apriori* in the sense that they are fixed before collecting data. Sai Sarada et.al (2018) have used weights that are inversely proportional to the squared deviation from the target.

Suppose the process has a true mean μ′ and true SD is σ′. Then the true value of k (standardized shift) will be $k_0 = \frac{\mu_1 - \mu'}{\sigma'}$ where μ_1 is the shifted mean. Then the true OC, denoted by O_{true} will be

$O_{true} = \Phi(3 - k_0\sqrt{n})$ - $\Phi(-3 - k_0\sqrt{n})$ (7)

Now instead of squared error we use absolute error and define the weights as

$w_i = (O_i - O_T)^{-1}$ ∀ i = 1, 2,…,9. Venkatesu Boya et al (2018) used this method to estimate the process spread using confidence interval of sample range.

Hence the new estimate of the OC will be of the form

$O_{new} = \frac{\sum_{i=1}^{9} w_i\ o_i}{\sum_{i=1}^{9} w_i}$ (8)

We call this *improvised point estimator* derived from interval estimates. It follows that O_{new} is a convex combination of O_i , i = 1, 2,…,9.

Remark: The method depends on the knowledge about the shifted mean μ_1 from which k_i's will be calculated. For running simulated trails, we have to input the hypothetical shift in the mean μ_1 and workout the resulting O_{new}.

In the following section we report the results of simulated experiments with different sample sizes and compare the resulting OC values.

7. Performance of the new estimate – A Simulation study

The experiment consists of 1000 random samples of size n for n = 5,8,10 generated from N (μ, σ^2) with μ_0 = 10.5 and σ_0= 1.0. For each sample, the mean ($\bar{x}$), range (R) and the 95% CI are calculated. Let the shifted mean be μ_1= 10.0 corresponding to which k can be found and this give one OC value. If we assume that the process truely operate at μ_0 and σ_0, we get k_0 = -0.5 so that the true OC denoted by O_{True} can be found. For n = 5,8 and 10 we get O_T = 0.970061, 0.943601 and 0.922028 respectively. The new OC for each of the 1000 samples is found after deriving k_i and w_i. The resulting values are combined using (8) to get the new OC. The mean and standard error of the new OC are then computed and compared with the classical method which occurs at O_5. The comparative results are shown in Table-1, where the performance is expressed interms of median absolute deviation

Table-1: Comparison of Estimates (1000 trials)

N	True OC	Estimate ± S. E		Median ± MAD	
		Classical OC	New OC	Classical OC	New OC
5	0.970061	0.6493 ±0.0093	0.9101 ±0.0023	0.7634 ± 0.2001	0.9448 ± 0.0506
8	0.943601	0.8926 ±0.0053	0.9256 ±0.0027	0.9567 ± 0.1141	0.9654 ± 0.0580
10	0.922028	0.4029 ±0.0095	0.5332 ±0.0052	0.4003 ± 0.2041	0.5581 ± 0.1127

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It can be seen that the new estimate has lower standard error irrespective of the sample (sub group) size. If we use robust estimate median for location and MAD for scale then also the new estimate provides better performance than the classical one.

Figure-1: Comparison of Classical and New estimates

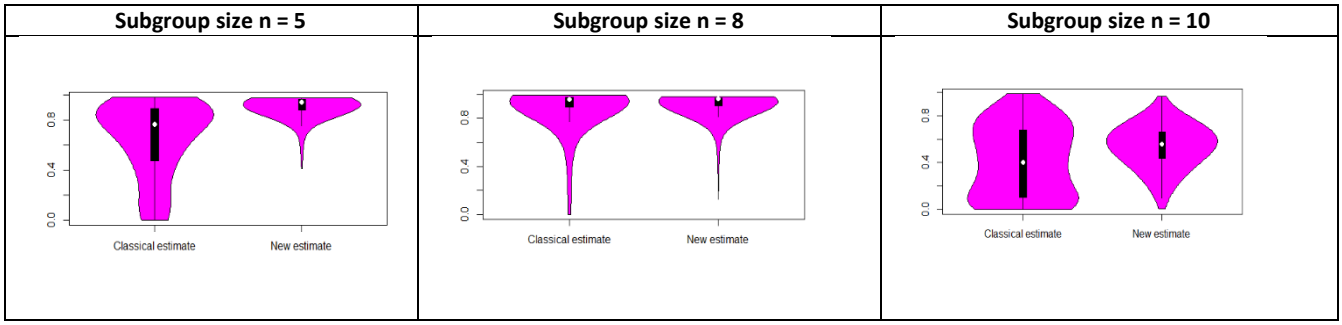

Figure-1 shows the violin plots for the new and classical estimates for different values of n.

8. Conclusions

Hence the triple estimate method offers a new system of consistent performance and provide reliable estimates of the process operating characteristic.

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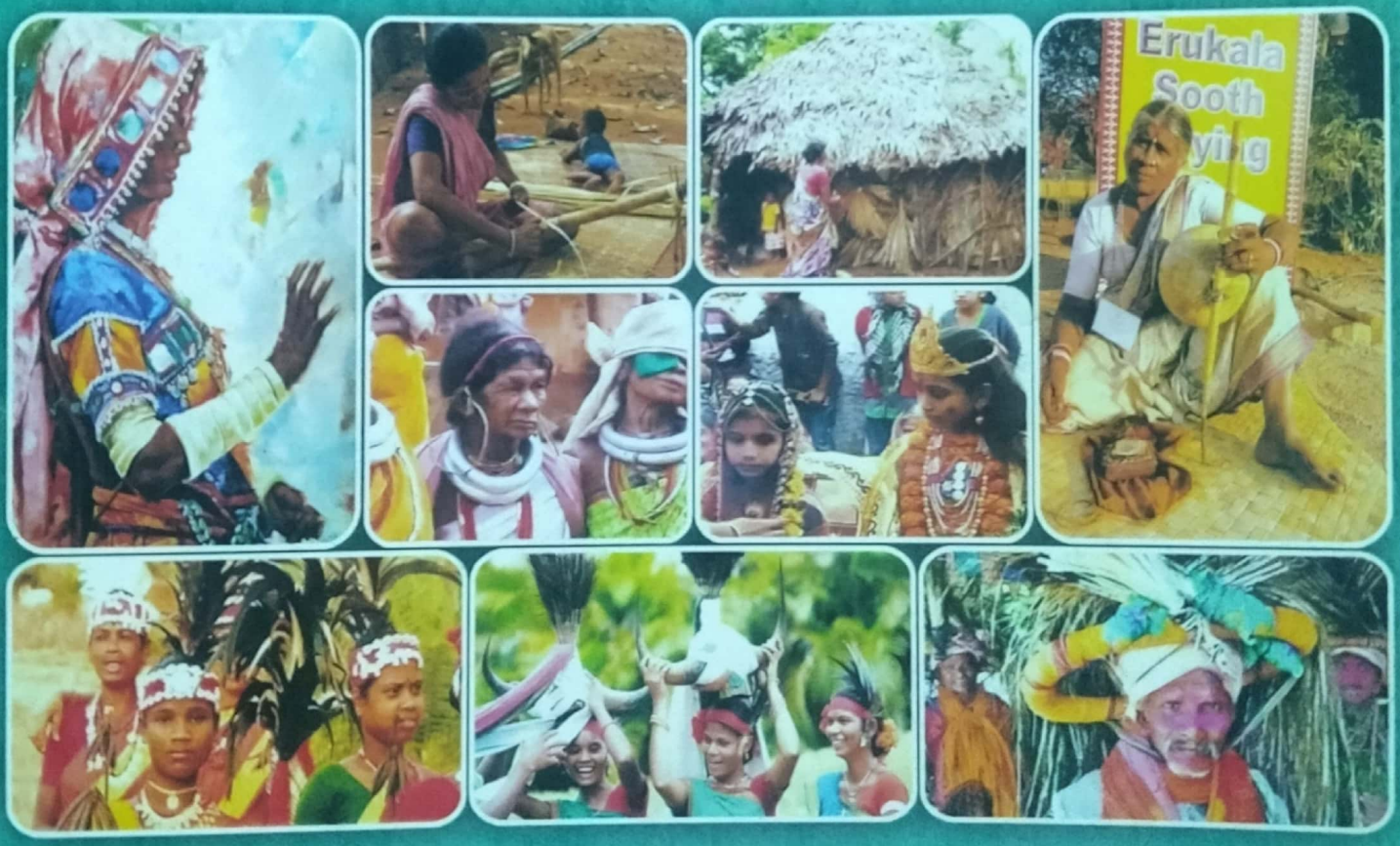

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- డా॥. ఉడాలి విష్ణుప్రియ, తెలుగు విభాగాధిపతి, సెంట్ ఆన్స్ మహిళా కళాశాల, మెహదీపట్నం, హైదరాబాదు, తెలంగాణ.

సమకాలీన జీవనానికి సాహిత్యం అద్దం వంటిది. సాంఘిక జీవనం అన్నప్పుడు అన్ని తరగతుల ప్రజల జీవన విధానాలు, పరిపాలనా రీతులు, వృత్తులు, ఆహారం, వేషధారణ, ఆభరణాలు, గృహం, విశ్వాసాలు, పండుగలు, జాతరలు, పెళ్లి పేరంటాలు, వినోదాలు మొదలైన అంశాలన్నీ చోటు చేసుకుంటాయి. నీరు, గడ్డి, కట్టె సమృద్ధిగా లభించడానికి అనువైన ప్రాంతమే మానవ జీవనానికి పునాది.

గిరిజన సంస్కృతులలో ఆచార బద్ధమైన సామాజిక, ఆర్థిక పరస్పర సహకారం కనిపిస్తుంది. ఒక కులం వారు మరో కులం వారి వృత్తిని స్వీకరించరాదు. కాబట్టి ఒకరు మరొకరిపై ఆధారపడి జీవించవలసి వస్తుంది. గిరిజనులలో కట్టు, బట్టు, జుట్టు విధానాలను బట్టి మనిషి ప్రవర్తన నిర్ధారింపబడుతుంది. కేంబ్రిడ్జిలో పనిచేసిన మతాచార్యుడు, తులనాత్మక మత గ్రంథాల అధ్యయన శీలి అయిన ఏ.సి.బకే తన సుప్రసిద్ధ రచన "Sacred Books of theWorld" (పెలికాన్-1954)లో ఋగ్వేదం, సుమేరియన్, బాబిలోనియా, ఈజిప్షియన్ ప్రార్థనా గీతాలకన్నా, రెడ్ ఇండియన్, ఆఫ్రికన్ ఆదిమ గీతాల కన్నా కూడా ప్రాచీనమని చెప్పదగ్గ ఒక మంత్రం గురించి పేర్కొన్నాడు. 'మేము తింటాం / నువ్వూ తిను' అనే ఈ మంత్రం తెలుగు మంత్రం! నల్లమలలో ఉంటున్న చెంచు తెగ ఏదైనా వేటాడినప్పుడో లేదా ఏ కంద మూలాలో సేకరించినప్పుడో ఆ ఆహారాన్ని సర్వేశ్వరుడి ముందు సమర్పించి అందులోంచి కొంత భాగాన్ని దేవుడికి సమర్పిస్తున్నప్పుడు చెప్పే మాట అది. అటువంటి పురాతన మంత్రాన్ని ప్రపంచానికి ప్రసాదించిన జాతి చెంచు వారిది. వారి భాష తెలుగు.

గిరిజన ఆదివాసీ చరిత్ర అంటే అడవి చరిత్ర. పూర్తిగా ప్రకృతిపై ఆధారపడ్డ ఆదివాసీ జీవనం వారి సంస్కృతి. అంటే ఈ దేశ సంపదలను సంరక్షించిన వారి సంస్కృతి. గిరిజన ఆదివాసీ సంస్కృతిపై ఆయా తెగల్లో చాలావరకు మౌఖికంగానే ఒక తరం నుంచి మరొక తరానికి ప్రసారమవుతూ వచ్చాయి. ఆంధ్రప్రదేశ్‌లో చెంచు తెగ ప్రాచీన సంచార తెగలలో ఒకటి. నల్లమల ప్రాంతంలోని కొండలూ గుట్టలే చెంచుల నివాస స్థలం. కృష్ణానదీ పరీవాహక ప్రాంతంలో చెంచులు విస్తరించి అటు నిజాం రాజ్యానికి ఇటు బ్రిటీషు పరిపాలనలోని మద్రాసు ప్రెసిడెన్సీకి సరిహద్దుగా ఉన్న కృష్ణానదికి ఇరువైపులా ఉన్న ప్రాంతాల్లో కనిపించేవారు. శ్రీలంకలోని ప్రాచీన తెగ అయిన వెద్దాల మాదరిగానే చెంచులు కూడా రింగుల జుత్తు, విశాల వదనం, చప్పిడి ముక్కు, పొడవాటి దవడతో పొట్టిగా నల్లగా ఉంటారు. శరీరాన్ని తమ పూర్వీకుల్లాగా ఆకులతో చుట్టుకోవడం ఇప్పుడు లేకపోయినా మగవారు గోచీ మాత్రమే పెట్టుకుంటారు. ఆడవారు నూలు రవిక, చీర కట్టుకుంటారు. అడవి చెంచుల కన్నా నిరుపేదలు మొత్తం భారతదేశంలో ఎక్కడా కనిపించరు. విల్లంబులు, ఒక కత్తి, గొడ్డలి, గుంతలు తవ్వే కర్ర, కొన్ని కుండలు, బుట్టలు, మరికొన్ని చింకి పాతలు.. ఇవే వీరి ఆస్థిపాస్తులు. చెంచుల్లో వ్యక్తిగత స్వేచ్ఛ స్వాతంత్ర్యం అన్న భావాలు బలంగా కనిపిస్తాయి. చెంచులు వేటను, అడవి పండ్లనూ ప్రసాదిస్తుందని విశ్వసించే ఒక దేవతను పూజిస్తారు. హిందువులు పరమాత్మగా పూజించే భగవంతుడిలోని కొన్ని లక్షణాలతో సారూప్యం ఉన్న ఒక 'ఆకాశ దేవుణ్ణి' కూడా చెంచులు పూజిస్తారు. జీవితం దేవుడిచ్చిన వరప్రసాదమనీ, మరణించిన జీవుడు దేవునిలో కలసిపోతాడనీ చెంచులు బలంగా నమ్ముతారు. చెంచుల ఇలవేల్పులైన శ్రీశైలం మల్లికార్జున స్వామి, అహోబిల లక్ష్మీనరసింహ స్వామి దేవాలయాలు వందల సంవత్సరాలుగా వీరి సంరక్షణలోనే ఉండేవి. శ్రీశైలంలోని మల్లన్న

ఆలయంలో జరిగే పూజా కార్యక్రమంలో చెంచులకు ప్రత్యేక స్థానం ఉంది. వీరు పార్వతీ దేవిని తమ ఆడపడుచుగా భావిస్తారు. దేవాలయాల గోడల మీద ఏవో పటులు, సంకేతాలు వ్రాసేవారు. స్త్రీలు ముత్యాల మీది కన్నా గురివిందల మీదనే ఎక్కువ మోజును చూపేవారు. ధూర్జటి "శ్రీ కాళహస్తీశ్వర మహాత్మ్యం"లోని చెంచుల జీవన చిత్రణంలో ఈ విషయాన్ని గమనించవచ్చు.

శ్రీ కాళహస్తీశ్వర మహాత్మ్యంలో ధూర్జటి ఆటవికుల జీవితాన్ని సహజ మనోహరంగా వర్ణించిన తీరు అద్భుతం. చెంచుల ఆహారపు అలవాట్లను కూడా రమణీయంగా వర్ణించారు. అత్తగారి ఇండ్లలో మాటలు పడకుండా ఉండడానికి ముందుగానే తల్లులు తమ కూతుళ్లకు వంటావార్పుల్లో చక్కని శిక్షణ ఇస్తారని తెలిపాడు. 'తిన్నని' అక్కలు కమ్మని ఆహార పదార్థాలను వండడంలో సిద్ధహస్తులనీ, ముఖ్యంగా మాంసం వండడంలో నేర్పరులనీ పేర్కొన్నాడు.

"కొండలకానలందదిరిగి క్రొవ్విన పందుల లేళ్లదుప్పులన్
చెండిన పెక్కు చందముల చిన్ననక పెద్దకగారు
వండుదురట్ల పటిట్టలును వండుదురిచ్చట నుండ నేల నా
కొండొకటానతీక యుడుమూరికి రాగదవయ్య లింగమా..!

వేట చెంచుల ప్రధాన వృత్తి. పంది, లేడి, దుప్పి మొదలైన జంతువుల మాంసాన్నే కాక పిట్టల మాంసాన్ని కూడా ఆహారంగా స్వీకరిస్తారు.

చెంచులు అడవి వందిని సంహరించి దాని మాంసాన్ని ఆహారంగా స్వీకరించే విధానాన్ని ధూర్జటి కన్నులకు కట్టినట్లుగ ఇలా చిత్రించాడు..

"క్రొవ్విన మేకలంబులను కొన్నిటి గూర్చి కమర్చి పెంచులన్
జివ్వుచు నెఱ్ఱిమన్నలది చివ్వున నీరివురంగనేర్చి
నోళ్లు విశులూర ప్రేట్చి చమురుట్టి పడంగఱకుట్లు గాల్చిక
ల్జువ్వున నీడనొక్క పరిశుద్ధ శిలాతల భూమి నందఱున్.."

క్రొవ్వెక్కిన పందిని చంపి మొదట మంటలో వేసేవారు. కమిలే విధంగా కాల్చి పెంకుల సహాయంతో తోలు ఊడదీసేవారు. ఎర్రమన్ను పూసి మళ్లీ నిప్పులో వేసి నీరు ఇగిరేటట్లు కాల్చేవారు. ఆ తర్వాత ముక్కలు చేసి సన్నని సలాకులకు గ్రుచ్చేవారు. మూడవసారి మళ్లీ నిప్పులో వేసి వాటిని చమురు కారేటట్లు కాల్చేవారు. ఆ తర్వాత వేటగాళ్లంతా కల్సువ్వి చెట్టు కింద కూర్చుని ఆ మాంసాన్ని ఆరగించేవారు.

- ధూర్జటి శ్రీ కాళహస్తీశ్వర మహాత్మ్యం

ఆ కాలంలో అన్ని తరగతుల వారు పాయసం పదార్థం వండుకుని తినేవారని ధూర్జటి ఇలా ప్రస్తావించారు.

"ఓ లింగమా వినుం.. నివ్వరి ప్రాలును, నొడిపిళ్ల కునుకు ప్రాలును వెదురుం
బ్రాలును సవరపు మెకముల పాలును గలపచీలు నీకు పాయసమునకున్.."

- ధూర్జటి శ్రీ కాళహస్తీశ్వర మహాత్మ్యం

చెంచులు వేటాడడంతో పాటు తమ నివాస భూములైన అడవుల్లో లభించే తేనెలనూ, పళ్లనూ, రకరకాల మూలికలనూ సేకరించి వాటిని గ్రామాల్లోనూ, నగరాల్లోనూ అమ్ముతారు. మంచన 'కేయూర బాహు చరిత్ర'లో వీరు అడవి నుంచి తేనెను తెచ్చి నగరంలో అమ్మినట్లు పేర్కొన్నాడు.

"ధరణిపయి లాటనరపతి పురి తేనియ
నమ్ముకొరకు బోయలపల్లెన్
చరియించు చుండువాడొక పురుషుందద
యొక్క కలశమునగొ కదకన్.."

- కేయూర బాహు చరిత్ర, మంచన

సాధారణంగా వేట రాజులకు వినోద కార్యక్రమాల్లో ఒకటి. బోయలకు అది జీవనోపాధి. ప్రాచీనకవుల్లో

ధూర్జటిలా వేటను వర్ణించిన వారు ఎవరూ లేరు. దీనికి కారణం.. వేటకు సంబంధించి ధూర్జటికి గల పరిచయమే. చెంచుల వేషధారణలో వారి ఇష్టాయిష్టాలు ధూర్జటి ఎంతో గొప్పగా వర్ణించారు. తిన్నని కథలో తిన్నని జన్మ స్థలం ఉడుమూరు. ఆ ఊరి చెంచులు ముత్యాలను రేగుపండ్లలాగా చూస్తారు. మంచి గంధం, కృష్ణాగరు కట్టెలను వంట కట్టెలుగా లెక్కిస్తారు. చెంచు స్త్రీలు పట్టు చీరలను కాదని పండుటాకులే కట్టుకుంటారు. రాజాన్నానికి బదులు అడవి ధాన్యాన్నే వండుకుంటారు. మాణిక్యా లకు బదులు గురువింద హారాలనే ధరిస్తారు. తూగు టుయ్యాలలను కాదని తీగలతో తయారైనఉయ్యాలల్లోనే ఊగుతారు -

"ఒకనాడు తెరవేటనుగ్ర సత్త్వంబుల
పుడమిపై తడకాలు పడవధించి
యొకసారి సారమేయోద్ధతి నుద్ధుర
స్తబ్ధరోమంబుల సంహరించి
యొకమరి దీమంబులడ్డి పాదులు దీర్చి
బహు విహంగంబుల పట్టి తెచ్చి
యొకవేళ డేగ వేటకు చని యెగజోపి
నానాండజముల ప్రాణమును గెడపి
ముంగి వేటేదు వేట సివంగి వేట
యిట్టి వేటయు గంటవే యెద్దు వేట
మొదలుగా గల వేటల యదనెఱింగి
తిన్నడొక్కక్క తూకు వర్తింపదొడగె"

- ధూర్జటి శ్రీ కాళహస్తీశ్వర శతకము

ధూర్జటి చెంచులు వేటలో ఉపయోగించే తెర చీర కట్టలను, ప్రోగు చుట్టలను, ఏటి వలలను, కుందేటి వలలను పేర్కొన్నాడు. అంతేగాక అతడు విడి వేటకవసర మైన ఉరులు, ఉరి గోలలు, బోనులు, చిక్కాలు మొద లైన సాధనాలను ప్రస్తావించాడు. వేటలో మొదట దొరికిన మృగాన్ని శివునికి అర్పిస్తారు.

"మున్నుపడిన మెకము గొనివచ్చి మిడిగ్రుడ్లు
పొడిచి నీట శిరము తడిపి తోక
కోసి ధూపమిచ్చి మీసంబు పెకలించి
కానుకిచ్చి కాటి జేని గొలిచి"

- ధూర్జటి శ్రీ కాళహస్తీశ్వర శతకము

వేటకుపయోగించే ఎన్నో సాధనాలు 'చంద్రభాను చరిత్ర'లో ఇలా పేర్కొనబడ్డాయి..

"వలలు నురుల్ సిడుల్ పిసులు వంకర దుడ్డులు
పందిపోట్లు ధీ
ములు గొర కత్తెరల్ జిగురు మోకులు బోసులు గాలి
యుడ్లు బం
గులు మిడివిండ్లు బందములు కొమ్ములు పాయలు
పల్లెత్రాళ్లు చి
వ్వల తడికెల్ ధరించి యిరవంకల జేరిరి కొందరు
ద్ధతిన్"

- మల్లన 'చంద్రభాను చరిత్ర'

యయాతి చరిత్రలో పాన్నెగంటి తెలగన్న వేటలో ఉపయోగించే రకరకాల వలలను ఒక జాబితాగా ఇలా ఇచ్చాడు చూడండి..

"వేట వలలను మేటి కుందేటి వలలను
నెలుక వలలను సవదండ వలలు దొడ్డి
వలలు పందిటి వలలను బలుపు మకిల
వలలు మొదలుగా గలిగిన వలలు మఱియు"

చంద్రభాను చరిత్రలో వేట కుక్కల పేర్లు చాలా చిత్రంగా ఉన్నాయి. వాటి వాటి స్వభావాన్ని అనుసరించి ఆటవికులు ఆ పేర్లు పెట్టినట్లు భావించవచ్చు.

"జాతర పుట్టచెండు నెరజాన గయాళి కరాళి దిట్ట చి
బోతు తుపాకి జోగి సుకబోగి తుటారి తలారి మారి నం
గాతి లకోరి కోరి యనగా చను కుక్కల కేలబూని..."

ధూర్జటి శ్రీ కాళహస్తీశ్వర మహాత్మ్యంలో చెంచు బాలకుడైన తిన్నని వేషధారణను కళ్లకు కట్టినట్లు ఇలా వర్ణించాడు..

"జలంకంబార్చి విభూతి కుంభాబీజ సంకీర్ణమే
... ... పుత్రుల్ గూడి యాదంబురిన్..

...పించ గింజల హారాలు, మొలత్రాళ్లు, ఆభర
...నెమలి తొకలు, తాయెత్తులు వీరికి అత్యంత
...పోయినవి. స్త్రీ పురుషులిద్దరూ నెమలి పించాలతో
...అలంకరించుకుంటారు.

...జాంజాలు వెంట్రుకల కొప్పు గాఢత
...నెమలి పించంబు జుట్టి ... ... నాయకుల
...

...చెంచు స్త్రీలను ధూర్జటి ఇలా వర్ణిం
...పైన చింపిరి జుట్టులో నెమలి పించాన్ని
...నుమట జేగురు బట్టు ధరించి, పాలిండ్లపై
...పేర్లనే గాక పండుటాకుల పైటను కూర్చుకుని,
...నికి కూడా నెమలి పించాన్ని చుట్టుకుని,
...మొనదేలిన కొయ్య బాణాలను చేత బట్టు
...స్త్రీలు తమ భర్తలతో అడవుల్లో తిరిగినట్లు"
...

...ల ఆటల్లో సింగి సింగడు ప్రధాన పాత్ర
...నాయికా నాయకులు డప్పుకు తగినట్టుగా
...స్తారు. ఇప్పపువ్వు సారా తాగితే మైమరచి కుప్పి
...స్తారు. నెమలి నృత్యం, కోతి నృత్యం వీరి
...ముఖ్యమైనవి. పూర్వం ప్రసిద్ధి చెందిన జానపద
...సింగి, సింగడు నృత్యం ఒకటి.

...రామం'లో వినుకొండ వల్లభరాయుడు కూడా
...ంది ఇలా చెప్పాడు..

"పావనంబైన తమిలేటి పరిసరమున
వేగికూరు వాటికా దేశ విపిన భూమి
గోపులను పేరి చెంచుల
కులమునందు గడిమికత్తుల నాగ
గలుగ గమ్మియలదు"

గుఱ్ఱం జాషువా గారు కూడా తమ 'గబ్బిలం' కావ్యంలో చెంచుల ప్రస్తావనను తెచ్చారు..

"విలునమ్ముల్ ధరియించి చెంచులు
తదాభీ లాటవీ మధ్య భూముల
కన్పట్టిన నంజలింపుము మహాత్ముండైన
భర్గుండు భక్తుల కిష్టార్థము లీయ
గోరిన గణస్తోమంబుల్ మాయ
పందుల వేటాడుచు భిల్లుడై నరుల
కన్నుల్ గప్పి క్రీడించెడిన్.."

ప్రకృతితో మమేకమైన గిరిజనుల సంస్కృతిలో చెంచుల జీవనం ప్రత్యేకమైనది. దానిని ప్రాచీన కావ్యాల్లో ప్రస్తావించిన తీరును ఇంతవరకూ మీతో పంచుకొన్నాను. గిరిజనులు ఇప్పటికీ ప్రజల్ని ఆకట్టుకోవ డానికి ప్రధాన కారణం.. వారి కట్టూ బట్టే! ప్రకృతి మనస్తత్వ మెలాంటిదో గిరిజనుల మనోచిత్రణ కూడా అలాంటిదే! ప్రముఖ కవులు రచించిన ప్రాచీన కావ్యాల్లోని వలు అంశాలు ఈ విషయాన్ని తేటతెల్లం చేస్తున్నాయి!

The Courtesans in Deccan History

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Miniaturists of medieval Deccan in the creation of the themes related to women produced theme of reality, sensuality and fantasy, among which depiction of courtesans constituted an important part. These paintings give us glimpse into the life-style of the courtesans and their role in Golconda and Hyderabad Kingdoms during 17th and 18th centuries.

A courtesan is a lady who is associated generally with wealthy, aristocracy or nobility as a prostitute or dancer who entertains them. Concubines are those ladies who cohabit with a man without being legally married to him, a mistress or a secondary wife to a certain extent. Both courtesans and concubines played a prominent role in medieval kingdoms. The life styles of these women almost remained the same, both being the representatives of sensuality and attractiveness with beauty to entertain the sultan and his nobility to fullest extent. They remained within harem and noble houses and such harem sense with royalty became one of the themes for artists to depict these courtly beauties and aesthetic figures in royal courts. The miniatures paint them amidst dark, vaulted cellars, huge halls, fountains and tanks which constituted one of the most striking styles of architectural excellence combined with artistic perfection.

In the miniatures depicting courtesans, we find a fusion of European, Persian and indigenous elements mainly during Golconda phase. During the Hyderabad school of paintings, the synthesis of Mughal and Deccani styles gave a new direction to these paintings.

A variety of lively and playful paintings were executed under the patronage of Qutb Shahis and Nizams with a typically Deccani swing. Gestures and glances exchanged among personages in paintings established a psychological personal wearing slippers, a rare feature of Deccani painting.

Similar painting depicts Bhagmati standing under a branch of a tree with a maiden she wears transparent skirt and seems to be enjoying the natural – beauty and sip of wine, which her maiden offered. A miniature painting of Deccani style depicts another courtesan Taramati seated on a terrace listening to a musician. She was dressed in typical Hyderabadi style with a turban and textile- pattern. The musician has a Hindu look with large big eyes and elegant features.

In another painting of a courtesan Premamati, she was depicted swinging with her attendants with a beautiful Deccani spring background. Among her attendants there are musicians with tambura who are entertaingin her. Two maiden's help her in swinging premamati was the favorite mistress of sultan Abul Hasan Tana Shah, the last of Qutb shahis.

An interesting beautiful miniature depicts premamati enjoying the fragrance of small flower, which she holds in her right hand. She stand facing right in profile, with garments and jewelry typical of Golconda. It is apt to point out here that there was a distinction in the dress worn by women of the Qutb shahi and Asaf Jahi periods. From the pictures of Qutb Shahi period, it appears that women wore narrow pyjama and a broad jama, sometimes the portion of the chest was open. Asaf Jahi ladies wore slightly narrow pyjama choli, kurta on which gold and silver laces were stiched and khada dupatta was used. The khada Dupatta continues to be worn today by the Muslim bride on the day of her wedding. Besides Muslims, this dress was prevalent among the families of Hindu of the upper classes, as this dress is combination of the Islamic style and the sari of the Hindus.

Miniature paintings though less evocative and more conventionally pretty covering the four sides of a small lacquered papier-mache box, perhaps a jewel casket, depict various scenes of princess and courtesans of which one side depicts a courtesan dancing. She wears typical Golconda dress of jama, veil and bodice and has curly shapes with broad features of a dancer. Meticulous draughtsman ship and restrained colors creates a mood of delicate sensuality. It was signed by Rahim Deccani. By that time Indian lacquer was beginning to influence Iranian lacquer ware. The other side of the casket depicts a prince with three courtesans.

At Golconda a miniature painting of a courtesan dated (c1630-1650 A.D.) depicts her enveloped in orange and purple scarves, which is a virtual translation of Isfahani work into Indian terms. Here Persian elements persisted in less assimilated form in the Deccan, seen in blue and white bottle and in the curly courtesan's hair. The azure background, violet and pink rocks and fluttering veils reveal the naked flesh of courtesans till waist. These are derived from European style of painting. The vermilion, cnmson, yellow-green, blue and violet colors are combined in the frenetic and textile like border is artfully related to the circular patterns of the flowers in the foreground of the miniature and to the trees on the horizon. The jungle-like border breaths of life and fertility.

An artist working at Golconda atelier painted a picture of courtesan deriving from Islamic, Indian and Chinese sources. In it, the courtesan wears diaphanous robes of pink, while her veil and border of the painting are green-like foliage. She holds a little bird, in her delicate left hand and wears necklaces made of pearls. Her dress decorated with roses is an oriental symbol of beauty.

A miniature painting of Bhagmati depicts her standing elegantly holding a rose in her right hand. She wears flowing robes of Deccani style and was depicted with simple-ornamentation. Another painting depicts Muhammad Qulin Qutb Shah meeting with Bhagmati with Golconda fort in the background. This painting is an artist view of the romantic episode of the royalty with a courtesan Bhagmati, who later on became the mistress of Muhammad Quli. Her name given to the city and capital of the kingdom that was named Bhagyanagar. Later on, when the Sultan married her and bestowed on her the title of "Haider Mahal"it was named Hyderabad. It depicts Bhagmati with broad features, sensititvity and delicacy. She was depicted dressed in a mixture of Hindu and Muslim fashion, with long designful skirt and dupatta overhead. Which convers her bodies. She was depicted.

A painting during transitional phase depicts a young prince seated on a throne in a garden surrounded by beautiful women, most probably courtesans of the time. "A painting during transitional phase depicted around (C1700-1725 A.D.) depicts ladies enjoying wine. It is an excellent picture of courtesans in a harem enjoying exotic life and pleasures of palace. A color – scheme of blue sky, orange and yellow flowers, pink flower – filled carpets, yellow, pink, brown garments etc., can be perceived in the painting. The women have beautiful facial features mainly of Hindu look, while the maiden with morchhal depicted has a Muslim look. The picture also depicts musicians entertaining these ladies. **(PLATE-XXXII).** Hence, the courtesans used to have their own courts complete with wine and entertainments and copied the Sultan. The scene is one of the luxury and well. Beautiful carpets are spread along with cushions and a large number of wine bottles lay scattered. The illustration of the cat seated is another common feature of Deccani painting.

This painting illustrates the sporting of courtesans who charming on account of their hirsing as if struck water from syringes discharged by naught gallants. These lovely women under the exhilaration of wine generally seize royalty. The quarters in which courtesans were depicted gives the feeling of swelling wild music and frangrance of their aesthetic bodies. The general entertainment aspects of royalty included singing and dancing by artists and courtesans, who are involved in these artistic pursuits, as if entwined under the gulf of love. Such depictions of courtesans are visual images of human affinity and create gay ambianc suffusing pleasure and enticement.

Another miniature painting of early 18th century depicts prince playing holi in harem with princess, musicians, courtesans, and dancers. "(PLATE XXXIII). Holi is a festival of spring and god of love and a festival, which occurs at the time on the full-moon day also known as Holika or Holaka. In this particular painting, the sultan seems to be playing Holi with his ladies of harem, while the floors are While the prince and his courtesans are involved in playing Holi, there are musicians who are entertaining them.

In such circumstance, the royalty are directly engaged in the ritual of throwing powder and musk, as a part of culture, which often delimits itself by its traditions and customs. The king being historically the functional and theoretically the representative of social order and prosperity of citizens in the social system and hence as symbolic overseer of the festival articulates that order and as conveyor established the legitimacy of the celebration in which the ladies are the main source of enjoyment.

In other words such depiction of festivals responds to a broad spectrum of human concerns, in the sphere of politics, it can be turned to account to celebrate and reinforce the power of sultan and in the social sphere it is a time of entertainment and merry making indicative of the annual renewal of society and in the sphere of religion, it celebrates the exploits of the gods and human worship of rejuvenation and renewal and the relationship between nature and humanity and in particular of men and women in which courtesans derived full length spirit at harem contributing their love and feeling to royalty.

Another panting during transitional phase depicts prince adored by courtesans of his harem. These ladies have Hindu way of dressing style and seem to be happy with the visit of the prince. Different patterns of printed textile formats and ornamental decoration of these women can be perceived in the painting. It was illustrated around 1700 AD.

Similarly few bewitchingly beautiful portraits of courtesans were painted at Hyderabad school under Nizams patronage, which were resuscitator of Deccani independence. These painting represent the idealized tenderness and gentle eroticism of courtesans.

One miniature painting depicts the leisure life led by these ladies in a garden, where they are depicted engaged in various pursuits like gossiping, drinking wine, listening to music, relaxing, moving – about, etc. This painting of courtesans carousing in the garden was executed about first half of 18th century.

Phytochemical and antimicrobial paneling of ethnobotanical plant *Hyptis suaveolens* (L) Poit.

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ABSTRACT

Plants are vast and diverse sources of bioactive compounds, among which secondary metabolites are the most dominant class of organic compounds. Researchers are keenly interested in natural products because of the complexity of their chemical structures and biosynthetic pathways. *Hyptis suaveolens* is is an ethnobotanically important medicinal plant belonging to the lamiaceae family. Plant extracts of this medicinal plant are widely used in traditional system of medicines as anti-inflammatory, antispasmodic, antirheumatic, antispeptic etc. Present work highlights the phytochemical analysis of bioactive components in different *Hyptis* leaf extracts and antimicrobial activities of leaf extracts (LE) and leaf+inflorescence extract (LIE). The presence of phytochemicals like- glycosides, proteins, steroids, phenols and tannnins was observed in all the leaf extracts. The antimicrobial activity of *Hyptis* leaf extracts against human pathogenic bacteria and fungi was also assessed in the form of zones of inhibitions. The microorganisms under study exhibited spectral differences in their susceptibility towards *Hyptis* leaf extracts and leaf+inflorescence extract (LIE). Out of the four leaf extracts (Steam distilled, methanolic, ethanolic and chloroform), steam distilled extracts exhibited broad spectrum antibiotic and antifungal activity against the tested microorganisms. Highest antibacterial and antifungal activity was observed against *Staphylococcus aureus* and *Fusarium oxysporum*. Further detailed characterizations of the phytochemicals may lead to discovery of new family of antimicrobial compounds.

Keywords - *Hyptis suaveolens*, leaf extract, inflorescence extract, antibacterial, antifungal, synergistic effect

I. INTRODUCTION

Since times immemorial, plants have been treasured sources of natural products for maintaining human health. Indians and Chinese have been using plants as medicines for pain management, inflammation, weight reduction etc., in traditional system of medicines. Due to their medicinal importance, plant extracts have been extensively used in Ayurveda to treat major ailments in naturopathies. Plants contain an arsenal of compounds called as phytochemicals which are exploited by pharmaceutical companies for the development of novel drugs. There has been a burgeoning interest in isolating and characterizing novel non-nutritive plant chemicals and exploring their medicinal properties. Organic chemists have developed several isolation, separation, spectroscopic and structure elucidation methodologies constituting the foundation of contemporary phytochemistry. Phytochemicals which are products of secondary metabolism in plants, are known to possess antimicrobial activity and thus could be explored for therapeutic treatments (Edeoga et al., 2005; Savithramma et al., 2011). The antimicrobial properties of plants have been investigated by several researchers all over the world (Dorman and Stanley, 2000; Bhalodia and Shukla, 2011). *Hyptis suaveolens* L. Poit., commonly known as wilayat tulsi or bushmint belongs to the family Lamiaceae. It is a potential medicinal herb which is reported to have high medicinal value and is widely seen in Telangana, India. The extracts and oils of this aromatic herb have been reported to have antimicrobial activities. This plant possess antispasmodic, anti-inflammatory, antiseptic, anticancer, antirheumatic and antifertility activity (Mandal et al., 2007). Due to increased resistance of pathogenic microbial strains towards existing antimicrobials, natural products have proved to be an effective alternative for the discovery of novel drugs. In order to discover new antimicrobial compounds, several research groups have been screening plant extracts to detect secondary metabolites with potential biological activities. These observations provided us a platform to determine the antimicrobial activity of leaf and leaf+inflorescence extracts of *Hyptis suaveolens*. We are reporting for the first time the antimicrobial activity of leaf+inflorescence, combined extracts of *Hyptis suaveolens* which synergistically are more efficient than leaf extracts alone. Results indicate antimicrobial potential of both the extracts strengthening the concept of employing these in pharma industry in the development of new antimicrobials.

II. Materials and Methods

2.1 Sample collection and Authentication

The fresh plant parts (leaves and inflorescence) of *H. suaveolens* were collected from *Hyptis* naturally populated area near shamshabad region of Hyderabad, Telangana in the month of September, 2018. The authentication of plant was done by Botanist, Dr. Mir Zahur Gul, Osmania University. The collected plants were initially washed thrice with tap water and finally once with distilled water. Excess water was drained by damping the plants on filter paper.

2.2 Preparation of extracts

Fresh samples (10g) each of *Hyptis* leaves and inflorescence were extracted with 100ml of the solvents such as methanol, ethanol and chloroform. The solutions were later filtered through Whatmann No.1 filter paper and the filtrate were collected (crude extracts) and were evaporated (at 40ºC) with the help of heating mantle (Kumar and Thampi, 2015). While steam distillation of plant leaves and inflorescence was carried out according to the method of Moreira et al., (2010). The residues so obtained were weighed and reconstituted with respective solvents to a final concentration of 500µg/ml.

2.3 Phytochemical Paneling

Paneling of the plant extracts for various phytochemical constituents- carbohydrates, alkaloids, cardiac glycosides, coumarin, saponins, flavonoids,phytosterols, fats and oils, phenols, tannins and proteins present was carried out using standard methods (Mozhiyarasi and Anuradha, 2016).

2.4 Test bacterial and fungal cultures

The bacterial cultures were obtained from IMTECH Chandigarh-*Bacillus subtilis* (MTCC-441), *Staphylococcus aureus* (MTCC-737), and *Pseudomonas aeruginosa* (MTCC-424) whereas, the fungi- *Aspergillus niger, Aspergillus flavus* and *Fusarium oxysporum* were obtained from Fungal Germplasm Culture Collection (FGCC), Rani Durgavati University, Jabalpur. The bacterial cultures and fungal cultures were maintained on nutrient agar and sabouraud agar (SDA) slants respectively and stored at 4ºC

2.5 Preparation of inoculum

Preparation of test bacteria inoculum was done by inoculating loopful of target bacteria (24 hour old culture) in 5 ml nutrient broth and incubated at 37±2ºC for 6-8 hours till a moderate turbidity was developed. The turbidity was adjusted to 0.5 McFarland standard by adding distilled water which correspond to the cell density $1.5x10^8$ (CFU/ml) (Mandal et al., 2007; Balouiri et al., 2016). Fungal cultures were grown for 5-7 days of respective fungi at 37±2 ℃. The sample of solvent extracts residue were dissolved in respective solvents and used as test extracts. Steam distilled plant extracts were dissolved in DMSO, 5% (Dimethyl sulphoxide) solvent. Parallel controls of neat solvents served as negative controls.

2.6 Disc Diffusion test for determining antibacterial activity (Zaidan et al., 2005)

Nutrient agar and Sabouraud agar plates were employed for disc diffusion test. 1 ml inoculum suspension was spread uniformly over the agar medium to form a lawn of test bacteria using sterile spreader. The readily prepared sterile discs were loaded. Sterile filter paper discs (6mm diameter) each impregnated with different solvent extracted leaf and inflorescence extracts were placed at equidistance on upper surface of the seeded agar medium. The paper diffuse discs were placed on the medium suitably apart and the plate were incubated at 37˚±2℃ for 24-48 hours. The antimicrobial activity was recorded by measuring the width of the clear inhibition zone around the disc using zone reader (mm). Antibiotic disc Gentamycin sulfate (40mg/ml) was used as a positive control, while discs soaked in respective solvent were used as a blank control.

2.7 Poisoned food technique for determining antifungal activity (Das et al., 2010)

For determination of antifungal activity, 20ml of sterilized and cooled growth media (SDA) with 10mg streptomycin was poured into pre sterilized Petri plates. Requisite amount of plant extracts i.e. 1000 µg/ml were pipetted into the plates and were uniformly spread plated using spreader. The control plates contained the medium supplemented with different solvents instead of plant extract. After the solidification of the agar medium, inoculums of the test fungi (disc of 6 mm diameter cut from periphery from 7 days old culture with the help of sterile cork borer) were placed aseptically in each Petri plates of treated and control sets. The assay plates were than incubated at 30 ± 2℃ for 5-7 days. Nystatin (20mg/ml) was taken as a positive control. After the desire period of incubation diameter of the fungal colony of treated as well as control sets were measured. The percentage of mycelial growth inhibition was calculated by mean value of colony diameter by the following formula and the experiment was conducted in triplicates.

$$\text{Percentage of mycelial inhibition} = \frac{dc - dt}{dc} \times 100$$

Where, dc – average diameter of fungal colony in control sets

dt - average diameter of fungal colony in treated sets.

2.8 Effect of mixture of *Hyptis* leaf and inflorescence extracts on microbial growth

The antimicrobial activity of a combination of essential plant extract (leaf+ inflorescence) was measured by using filter paper disc diffusion method (Vincent and Vincent, 1944) for determining their possible synergistic activity. The essential plant extracts-leaf and inflorescence were blended with each other in 1:1 ratio. Thereafter, the methodology mentioned under preparation of spore suspension and test sample heading was followed. Aliquots of 20 ml seeded medium were poured in each sterile nutrient agar plates. Sterile filter paper discs (6 mm diameter) each impregnated with 10 µl of different solvent extracts (1:1) was placed at equidistance on upper surface of the seeded agar medium. The plates were then left undisturbed for 30 minutes to allow diffusion of the sample into the agar at room temperature the diameter of inhibition zone formed by different combination of plant extract was recorded after 24-48 hrs of incubation at 37˚±2℃. Whereas, fungitoxic nature of the plant mixture was determined by applying poisoned food technique as described earlier.

III. RESULTS AND DISCUSSION

3.1 Phytochemical paneling

Plants produce a wide variety of bioactive metabolites including tannins, terpenoids, alkaloids, and flavonoids which possess potential antimicrobial properties. In our present research work, *Hyptis suaveolens*, different leaf extracts showed the presence of carbohydrates, alkaloids, cardiac glycosides, coumarin, saponins, flavonoids, phytosterols, fats and oils, phenols, tannins and proteins was confirmed by performing various phytochemical tests as depicted in Table 2. Similarly, phytochemical investigations of various extracts of leaf extracts of *Hyptis suaveolens* indicated the presence of carbohydrates, alkaloids, glycosides, steroids, flavonoids, phenols, terpenoids and proteins (Mozhiyarasi and Anuradha, 2016). Ethanolic extract contained alkaloids, glycosides, carbohydrates, proteins, steroids, flavonoids, phenols, terpenoids and quinones. Methanolic extract contained alkaloids, glycosides, carbohydrates, proteins, steroids, flavonoids and phenols. Chloroform extract exhibited positive results indicating the presence of alkaloids, glycosides, carbohydrates, proteins, steroids, flavonoids and phenols. Similar studies on phytochemical screening of *Hyptis* leaf extracts has been also undertaken by several researchers (Mandal et al., 2007; Kumar and Thampi, 2015; Mozhiyarasi and Anuradha, 2016).

3.2 Antibacterial paneling

In the present study, the antibacterial activity of *Hyptis* leaf extracts in different solvents was determined by measuring the width (mm) of the inhibitory zones by following disc diffusion method. The antibacterial activity was determined against two Gram positive bacteria *i.e. Bacillus subtilis* and *Staphylococcus aureus*; and one Gram negative bacteria- *Pseudomonas aureus*. The results obtained have been summarized in Table 2. Among all the extracts, steam distilled extract (essential oil) showed maximum antibacterial activity and significant inhibitory action against all the test bacteria. Maximum zone of inhibition was observed against Gram positive bacteria-*Bacillus subtilis* followed by Gram negative bacteria-*Pseudomonas aeruginosa*. In case of ethanolic extract, the inhibitory zone followed the same pattern as exhibited by steam distilled extract. On the other hand, chloroform extract showed significant and equal inhibitory action against *Bacillus subtilis* and *Staphylococcus aureus*. While methanolic extract exhibited least inhibitory action on nearly all the test bacteria as evidenced from the diameter of zones of inhibition. Reference antibiotic used was Gentamycin sulfate at 40mg/ml concentration and Table 2 also contains the zones of inhibition against different test bacteria.

3.3 Antifungal paneling

The fungitoxic spectrum of the plant leaf extract as measured by poisoned food technique is represented in Table 2. The antifungal activity of *Hyptis* leaf extracts in different solvents shows a distinctive pattern. As in the case of fungi, among all the extracts, steam distilled extract (essential oil) exhibited maximum antifungal activity against all the test fungi. Steam distilled extract (essential oil) was found to be the most effective antifungal against all the test fungi- *Aspergillus niger*, *Aspergillus flavus* and *Fusarium oxysporum* as evidenced by % mycelial growth inhibition, followed by chloroform, methanol and ethanol extracts. On the whole, comparing the antimicrobial effects, antibacterial effect was observed to be more effective than antifungal effect. Reference antifungal used was Nystatin at 20mg/ml concentration and Table 2 represents % mycelial growth inhibition or antifungal activity against the test fungi.

3.4 Antimicrobial paneling of a combination of *Hyptis* leaf and inflorescence extracts

The combination of *Hyptis* leaf and inflorescence extracts was also assessed for its antimicrobial activity as shown in Table 3. Results indicate a significant increase in overall antimicrobial activity. The combination of extracts was able to enhance the antibacterial activity towards all the test bacteria, while the fungitoxicity spectrum results too indicated an overall increase in antifungal activity. There was a simultaneous increase in both the antibacterial activity (Gram positive and negative) and antifungal activity by all the plant extracts indicating some synergistic action of the leaf and inflorescence extracts. Steam distilled leaf and inflorescence extracts synergistically enhanced antibacterial activity against *Bacillus subtilis*, followed by *Pseudomanas areuginosa*. While maximum % growth inhibition was achieved against *Aspergillus niger* by a combination of steam distilled extracts, followed by antifungal effect on *Fusarium oxysporum* and *Aspergillus flavus*.

3.5 Antimicrobial paneling- Over the past few decades, there has been a whopping upsurge in the investigation of natural products as sources of novel antibacterial agents. Plants have been used to treat or prevent ailments since times immemorial and phytochemicals present in them possess a plethora of medicinal properties (Lewis and Ausubel, 2006; Sathish et al., 2010; Savithramma et al., 2011). Several plant extracts have been extracted in various solvents and have been evaluated for their antimicrobial activities. Steam distillation, petroleum ether, and ethanol extracts from *Hyptis suaveolens* leaves were evaluated for their antimicrobial activity *in vitro* (Mandal et al., 2007). They observed that among the various extracts, steam distillation extract exhibited broad-spectrum antibacterial and antifungal activity against the tested organisms. Highest antifungal and antibacterial activity was reported against *Aspergillus niger* and *Micrococcus luteus*, respectively. Steam distilled extracts (SDE) contain essential oils as their major constituents which are known to possess antimicrobial properties. Monoterpene constituents in SDE exert membrane-damaging effects on microbial strains and also stimulate leakage of cellular potassium ions which is lethal to microorganisms (Asekun et al., 1999).

In another research work, screening phyto-constituents and determining antimicrobial ability of various extracts of *Hyptis suaveolens* was done (Mozhiyaras and Anuradha, 2016). They employed disc diffusion method to evaluate antimicrobial activities of aqueous, ethanol, methanol, chloroform extract of *Hyptis*. Their studies indicated chloroform extract to exhibit inhibitory activity against *Escherichia coli* and *Staphylococcus aureus*; while ethanolic extract showed highest inhibitory activity against *Pseudomonas aeruginosa* and antifungal activity was recorded maximum against *Aspergillus Niger*. Thus, an arsenal of antimicrobial activities was recorded with various solvent extracts. In an another interesting study, significant biological activity of *Hyptis carpinifolia* steam distilled leaf extracts was reported against Gram positive and negative bacteria at varied concentrations (Camargo et al., 2017).

Past and present investigations clearly indicate the antagonistic potential of *Hyptis* leaf extracts against an array of human pathogenic bacteria and fungi. But the hallmark of our study was that we report for the very first time the antimicrobial effects of leaf and inflorescence together synergistically.

CONCLUSION

Present study thus highlights the antimicrobial activity of *Hyptis* leaf extracts and leaf+inflorescence extracts as effective antimicrobials. The steam distilled leaf extracts and leaf+inflorescence extracts proved to be active antibacterials against two Gram positive and one Gram negative test bacteria. Results of Antifungal activity indicated steam distilled extracts of *Hyptis* also to be good antifungal agents. Leaf and inflorescence extracts together elicited better antimicrobial properties. This synergistic property could be exploited towards the use of plants as therapeutic agents. Synergistic effects of ethnomedicinal plant *Hyptis suaveolens* leaf and inflorescence extracts on microorganisms was investigated successfully, thus providing new insights into core phytochemical research towards the discovery of novel and lucrative antimicrobials.

ACKNOWLEDGEMENTS

The authors wish to thank Principal Sister Amrutha, St. Ann's College for Women, Mehdipatnam, Hyderabad, for providing the necessary laboratory facilities and also for the financial assistance.

Table 1: Phytochemical analysis of *Hyptis suaveolens* leaf extracts

Phytochemical tests	Steam distilled	Ethanol	Methanol	Chloroform
Carbohydrates	-	+	-	+
Alkaloids	-	+	-	-
Cardiac glycosides	-	-	+	+
Coumarin	-	+	+	-
Saponins	-	+	+	+
Flavonoids	-	+	+	+
Phytosterols	-	+	-	+
Fats and oils	+	-	-	+
Phenols	-	+	+	+
Tannins	-	+	+	+
Proteins	-	+	+	+

(+) Indicates Presence, (-) Indicates Absence

Table 2: Antibacterial activity of *Hyptis suaveolens* leaf extracts (500 µg/ml)

S.No	Plant extracts	Test organisms					
		Test bacteria Zones of Inhibition (mm)			% Growth Inhibition of Test fungi		
		B.s	S.a	P.a	A. n	A. f	F.o
1	Steam distilled	20±0.21	16±0.22	18±0.06	65±0.13	60±0.26	61±0.22
2	Ethanol	18±0.12	11±0.06	16±0.14	44±0.09	40±0.17	50±0.16
3	Methanol	12±0.08	12±0.16	14±0.08	52±0.15	53±0.09	46±0.09
4	Chloroform	16±0.11	14±0.12	13±0.16	60±0.30	58±0.14	53±0.11
5	Antibiotic/ Antifungal	33±0.09	42±0.08	36±0.14	100±0.18	100±0.11	100±0.25

Test Bacteria-B.s- *Bacillus subtilis*; S.a- *Staphylococcus aureus*; P.a- *Pseudomonas aeruginosa*
Test Fungi- A.n- *Aspergillus niger*; A.f-*Aspergillus flavus*; F.o-*Fusarium oxysporum*
Values are the mean of triplicates (Mean ± SE)
Including the diameter of disc (6 mm)
Antibiotic- Gentamycin sulphate (40 mg/ml); Antifungal-Nystatin (20mg/ml)

Table 3: Antibacterial activity of *Hyptis suaveolens* LS (leaf+inflorescence) extracts (1000 µg/ml)

S.No	Plant extracts	Test organisms					
		Test bacteria Zones of Inhibition (mm)			% Growth Inhibition of Test fungi		
		B.s	S.a	P.a	A. n	A. f	F.o
1	Steam distilled	24±0.21	18±0.22	22±0.06	68±0.13	63±0.26	65±0.22
2	Ethanol	21±0.12	14±0.06	19±0.14	48±0.09	45±0.17	43±0.16
3	Methanol	15±0.08	15±0.16	16±0.08	55±0.15	58±0.09	51±0.09
4	Chloroform	19±0.11	16±0.12	15±0.16	62±0.30	60±0.14	56±0.11
5	Antibiotic/ Antifungal	33±0.09	42±0.08	36±0.14	100±0.18	100±0.11	100±0.25

Test Bacteria-B.s- *Bacillus subtilis*; S.a- *Staphylococcus aureus*; P.a- *Pseudomonas aeruginosa*
Test Fungi- A.n- *Aspergillus niger*; A.f-*Aspergillus flavus*; F.o-*Fusarium oxysporum*
Values are the mean of triplicates (Mean ± SE)
Including the diameter of disc (6 mm)
Antibiotic- Gentamycin sulphate (40 mg/ml); Antifungal-Nystatin (20mg/ml)

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AN OBSERVATIONAL STUDY ON CAUSATIVE FACTORS SEEN IN PATIENTS UNDERGOING CORONARY ARTERY BYPASS GRAFTING (CABG)

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Abstract **Aim:** to study the effect of life style changes and diet as causative factors among patients undergoing coronary artery bypass grafting.

Objectives: to assess the prevalence of cabg, to explore the association of lifestyle and dietary factors among patients undergoing cabg.

Results: among 60 subjects the detailed study identified the common risk factors with respect to coronary artery bypass grafting. the studies showed a higher percentage of risk for cabg in age group of 41-60 years and is mostly prevalent in males. majority of patient are with normal bmi and non-smokers.

hypertension and diabetes are superiorly predominant and dietary patterns recorded are favorably non vegetarians.

Conclusion: from the result it is very clear that majority of patients studied with cabg belongs to age group 41-60 years and is mostly seen in males. majority of them are accompanied with co-morbidities like hypertension, obesity and diabetic. and predominantly follows a non- vegetarian diet**.**

key words: Cardiovascular diseases, Coronary Artery Bypass Grafting, Hypertension, Obesity, Diabetes, Diet.

I. INTRODUCTION

CARDIOVASCULAR DISEASES (CVDS) ARE A GROUP OF DISORDERS OF THE HEART AND BLOOD VESSELS. . CARDIOVASCULAR DISEASES ARE THE LEADING CAUSE OF DISEASE BURDEN AND DEATHS GLOBALLY. (1) AND THEY INCLUDE:

- Coronary heart disease – disease of the blood vessels supplying the heart muscle;
- Cerebrovascular disease – disease of the blood vessels supplying the brain;
- Peripheral arterial disease – disease of blood vessels supplying the arms and legs;
- Rheumatic heart disease – damage to the heart muscle and heart valves from rheumatic fever, caused by streptococcal bacteria;
- Congenital heart disease – malformations of heart structure existing at birth;
- Deep vein thrombosis and pulmonary embolism – blood clots in the leg veins, which can dislodge and move to the heart and lungs.

Important causes of cardiovascular disease include atherosclerosis, when fatty deposits accumulate in the arteries.

Atherosclerosis is also the most common cause of cardiovascular disease. It can be caused by correctable problems, such as an unhealthy diet, lack of exercise, being overweight and smoking. Damage to the circulatory system can also result from diabetes and as the result of other health conditions, such as a virus, an infection, or a structural problem that the person was born with. It often involves high blood pressure, but this can be both a cause and a result of cardiovascular disease.

Coronary Artery By-pass Grafting

Coronary Artery Bypass Graft surgery (CABG) is a surgical procedure that is used to treat coronary artery disease (CAD). In CAD, a waxy substance called plaque builds up inside the blood vessels (coronary arteries) that are responsible for supplying oxygen and nutrients to the heart muscles. This leads to narrowing of the coronary arteries. During the procedure, the doctor surgically connects a healthy blood vessel from your leg, arm or chest to the heart and creates a new pathway around the blocked or the partially blocked artery to restore blood flow.

Percutaneous Transluminal Coronary Angioplasty (PTCA)

Percutaneous transluminal coronary angioplasty (PTCA) also called percutaneous coronary intervention (PCI) is a minimally invasive procedure to open blocked or stenosed coronary arteries allowing unobstructed blood flow to the myocardium.

The present study aims at conducting an observational study to know the causative factors of patients undergoing CABG

OBJECTIVES:

- To assess the prevalence of CABG and its associated risk factors among adult population belonging to age group 21-60 years.
- To explore the association of the following factors with CABG
  Diet – high fat intake, low fiber intake
  Hypertension
  Obesity
  Smoking
  Physical inactivity
- To bring awareness among people regarding the lifestyle modifications
- To educate them regarding the dietary modifications to be followed , so as to reduce the risk factors leading to CABG

Population and Sample

The sample population (n = 60) was randomly chosen from a Multi speciality Hospital of Secunderabad. All the patients were of different age groups of 21-80, sex, socio- economic status, ethnicity with different co-morbidities. A pre tested format consisting of Patient profile, subjective data, objective data, bio-chemical data, medications and 24hour dietary recall followed by Medical Nutrition Therapy during the hospital stay.

I. RESEARCH METHODOLOGY

The study was taken up by 3 students of P.G Diploma In Nutrition and Dietetics on the patients who were posted for CABG in a Multi speciality hospital, to know the causative risk factors during the tenure of 3 months. Subjects were analysed for the presence of co-morbidities and dietary factors .Hypertension, Obesity, Diabetes Mellitus , Hypothyroidism and combination of these were analysed.

PARTICIPANTS:

The sample population (n = 60) was randomly chosen from a Multi speciality Hospital of Secunderabad. All the patients were of different age groups of 21-80, sex, socio- economic status, ethnicity with different co-morbidities.

MATERIALS AND METHOD:

A structured questionnaire was designed for undertaking the study to know the parameters such as –Patient profile, chief complaints, diagnosis, present illness, history of past illness, cardio-vascular surgery the patient underwent, subjective data , objective data, biochemical data, medication given, 24-hour dietary recall, diet on discharge of individual were followed and analyzed.

The entire data was recorded and analyzed in detail. The attributes dealt in depth were –Gender, age group, BMI ranges, biochemical parameters, types of medications given, type of diet to know the consumption of fiber and fat, diet on discharge, their percentages and number were calculated for the compilation of the data .

The most common symptoms analyzed in the compilation of study are- chest pain, shortness of breath, decreased appetite, weakness , pain , etc.

STUDY SUBJECTS: Patients posted for CABG

STUDY DURATION: The study was conducted over a period of 3 months.

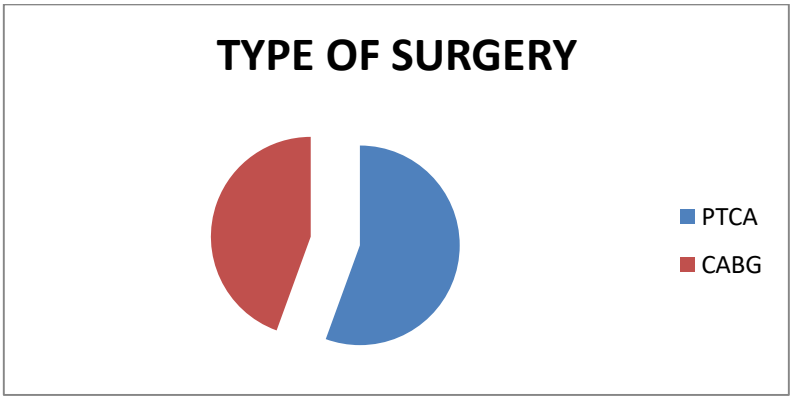
OBSERVATION: From the study it was observed that patients who underwent CABG, were having abnormal biochemical parameters, and their 24-hour recall showed that their diet was low in fiber, more in fats and simple carbohydrates.

STATISTICAL ANALYSIS: The data of present study was analyzed using percentages and is represented through pie charts and bar diagrams.

IV. RESULTS AND DISCUSSION

CARDIOVASCULAR SURGERIES PERFORMED :

TYPE OF SURGERY	NUMBER	PERCENTAGE
Minor (PTCA)	60	50%
Major (CABG)	60	50%



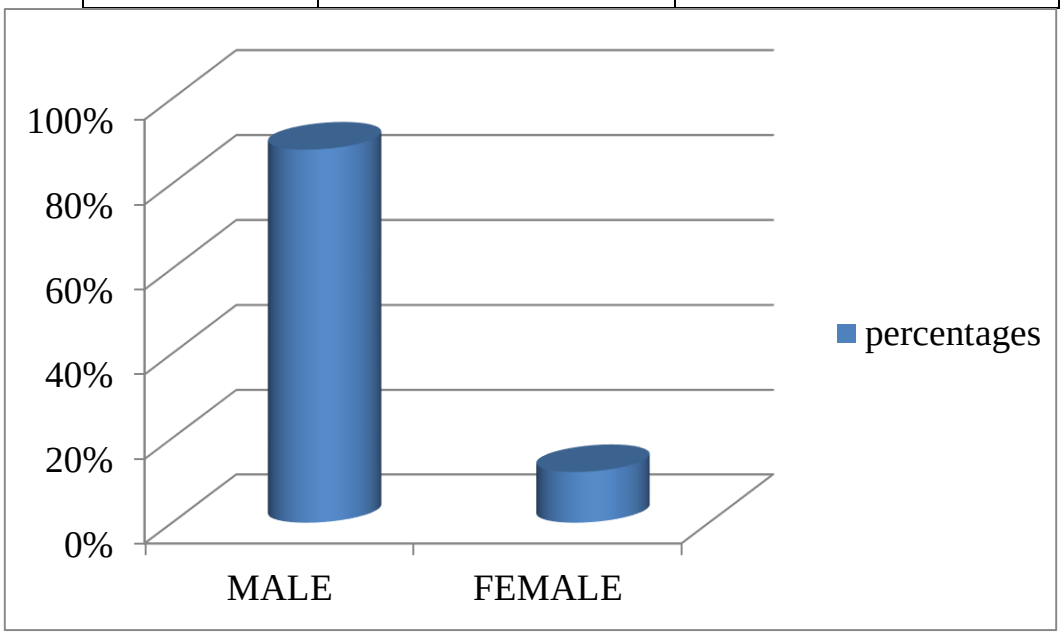
The above diagram represents the percentages of surgeries i.e., 60% minor and 40% major surgeries.

GENDER CLASSIFICATION

The total number of patients assessed was 60 of which male and female patients were present. The table below gives the gist.

GENDER PROFILE:

GENDER	SURGERY Number	Percentage
MALE	53	88%
FEMALE	7	12%

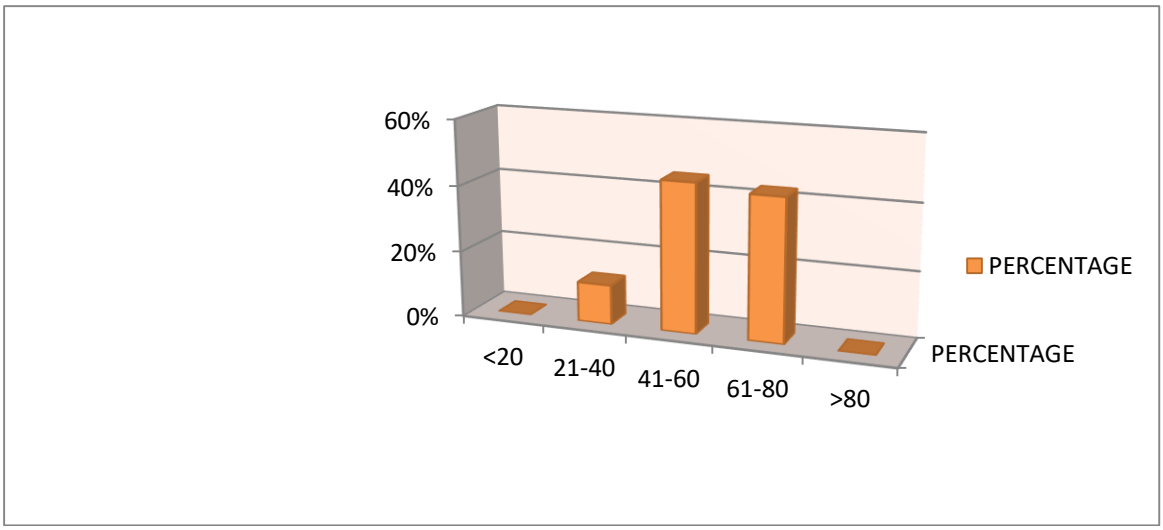


The above bar graph represents that the majority of the patients assessed with major surgery profile were males (88%) and females (12%) respectively.

AGE CLASSIFICATION

The age distribution of the patients is shown below :

AGE	NUMBER	PERCENTAGE
<20	-	-
21-40	7	12%
41-60	27	45%
61-80	26	43%
>80	-	-

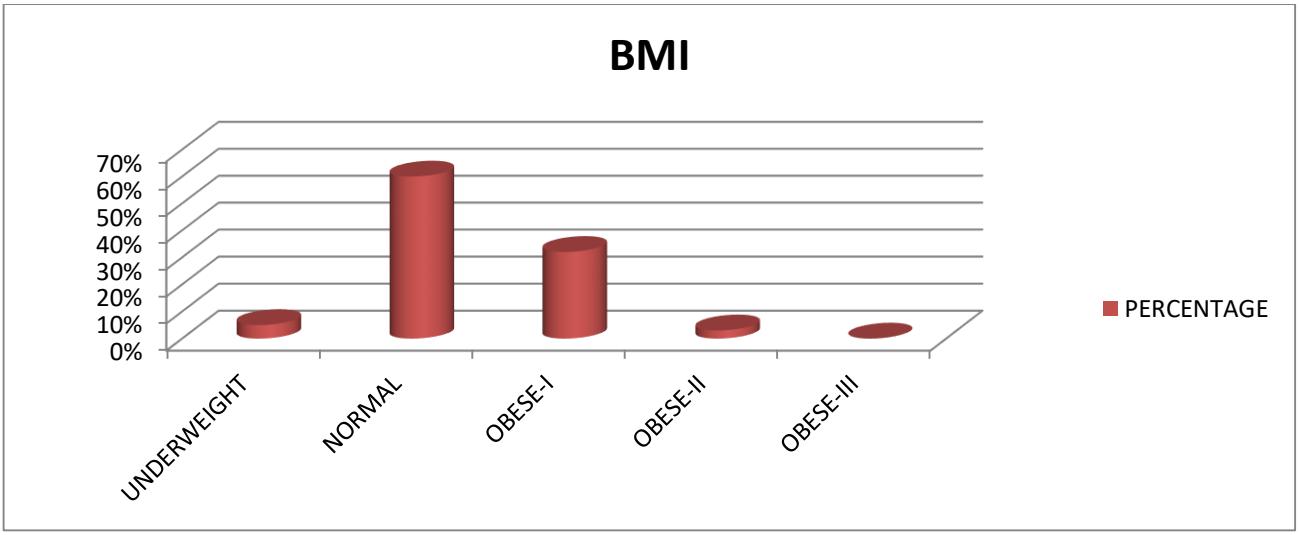


From the above representation, it is observed that CABG surgeries performed are estimated highest i.e.. 45% in the group of 41-60 years , 43% in the group of 61-80 years followed by 12% in the age group 21-40 years .

BMI PROFILE:

The patients were assessed as per BMI and classified according to their nutritional status.

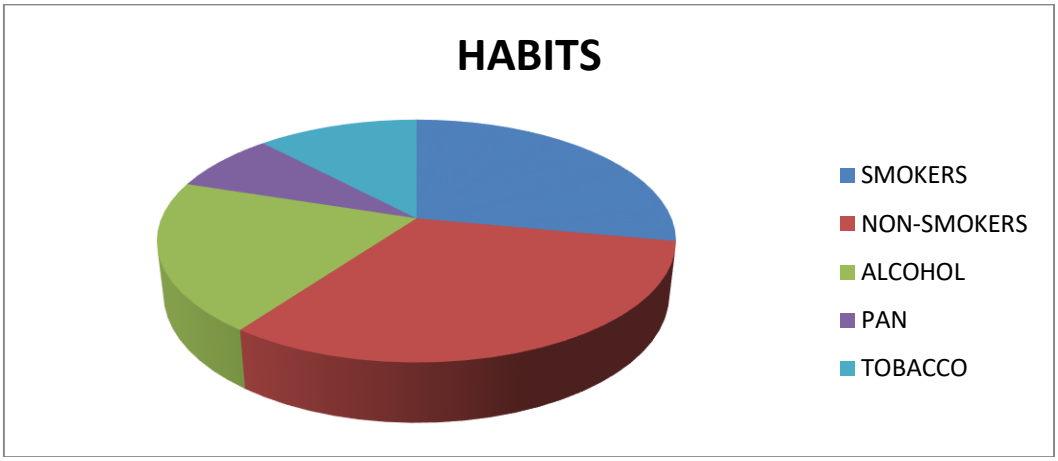
RANGES	NUMBER	PERCENTAGE
UNDERWEIGHT(<18.5)	3	5%
NORMAL(18.5-24.9)	36	60%
OBESE GRADE- I (25-29.9)	19	32%
OBESE GRADE –II(30-39.9)	2	3%
OBESE GRADE-III(>40)	0	-



The graph represents the percentage of BMI of the subjects; of which 5% are underweight, 60% are normal, 32% are obese grade-1, 3% are obese grade-2 and 0% are obese grade-3

SOCIAL HABITS:

SOCIAL HABIT	NUMBER	PERCENTAGE
SMOKERS	17	28%
NON-SMOKERS	19	32%
ALCOHOL	12	20%
PAN(BETTLE LEAVES)	5	8%
TOBACCO	7	12%

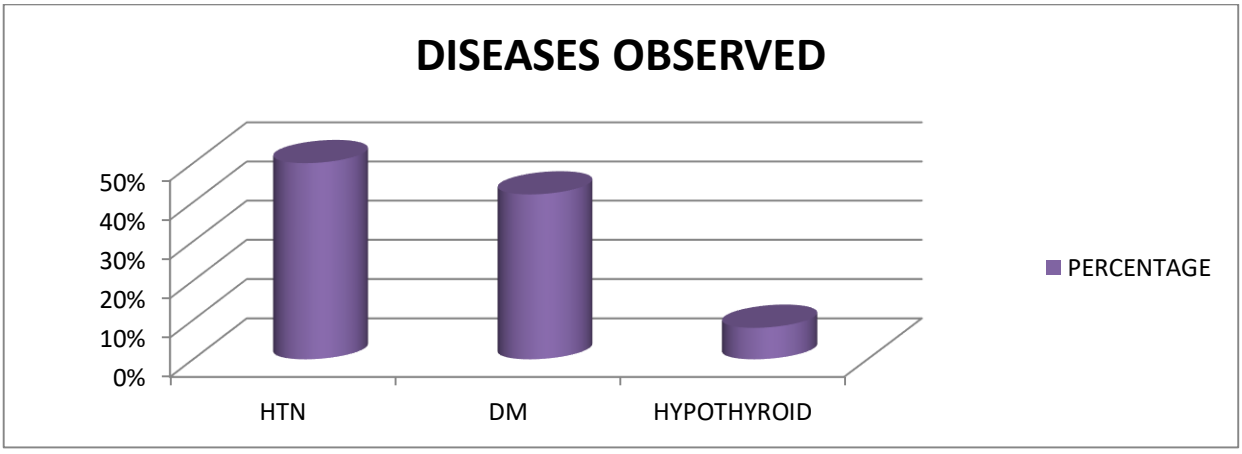


The above pie chart represents the percentage of social habits of the subjects, out of which 28% are smokers, 32% are non-smokers, 20% are alcoholic, 8% are pan eaters and 12% are tobacco chewers.

VARIOUS DISEASE CONDITION OBSERVED IN PATIENTS:

The patients were admitted due to various metabolic diseases such as Hypertension, Diabetes, Hypothyroidism, etc..

DIAGNOSIS	NUMBER	PERCENTAGE
Hypertension	30	50%
Diabetes Mellitus	25	42%
Hypothyroidism	5	8%



From the estimated data collected of all the patients, 50% were hypertensive, 42% were diabetic and 8% were hypothyroid.

SUBJECTIVE DATA:

The subjective data of the patients were evaluated as shown in the table.

SUBJECTIVE DATA	**STATUS**	**NUMBER**	**PERCENTAGE**
Appetite	Normal	50	83%
	Polyphagia	-	-
	Decreased	10	17%
Hunger	Normal	54	90%
	Sub-optimal	5	8%
	Starvation	1	2%
Thirst	Normal	55	92%
	Polydypsia	5	8%
	Decreased	-	-

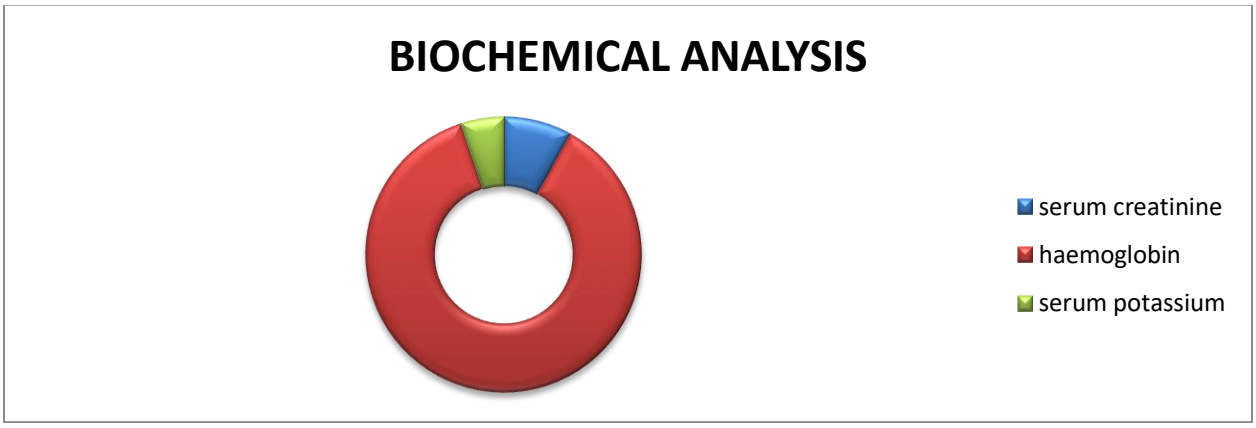
Bowel	Normal	55	92%
	Constipated	5	8%
	Diarrhea	-	-
Micturation	Normal	58	97%
	Polyuria	2	3%
	Oliguria	-	-
Sleep	Good	58	97%
	Unrefreshing	2	3%

Most of the patients suffering from cardiovascular disease have normal appetite, only few are assessed with decreased appetite. About 42% were diabetic among which 8% complained of polydypsia, 3% was complaining of polyuria, and 97% were having normal micturation. 92% had normal GI function except for few. And also 97% was having good and refreshing sleep whereas 3% were having unrefreshing and disturbed sleep.

BIOCHEMICAL PARAMETERS

The biochemical data of the patients were evaluated and interpreted. The details are shown in the table.

ABNORMAL BIOCHEMICAL PARAMETERS	NUMBER (n=60)	PERCENTAGE
↑ Serum creatinine	5	8%
↓ Haemoglobin	52	87%
↓ Serum potassium	3	5%



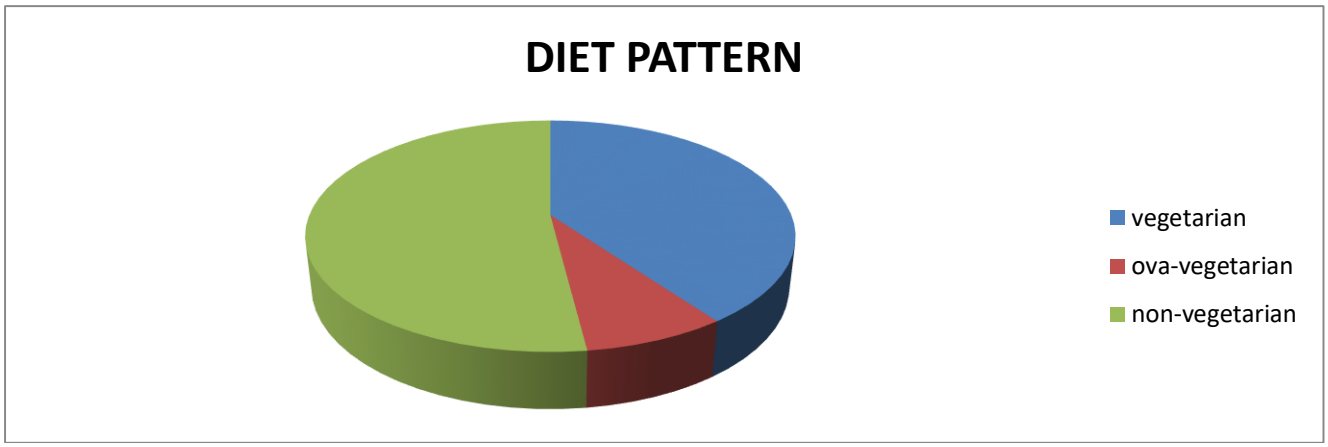
From the analysed data ,8% of the subjects were having increased serum creatinine levels, 87% of them were having low haemoglobin levels, and 5% of them were having low serum potassium levels.

DIET PATTERN :

On assessing the patients they were grouped under following type of diet pattern.

TYPES OF DIET PATTERN

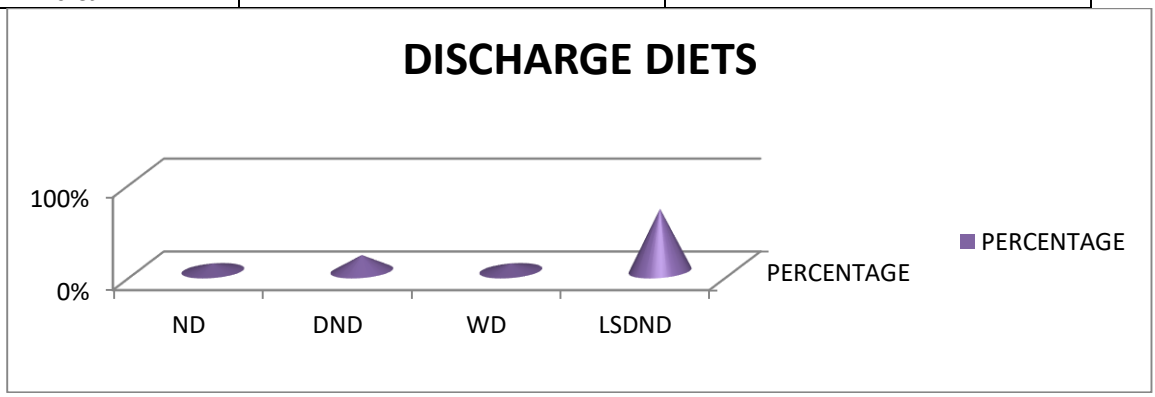
Types of diet	Number	Percentage
Vegetarian	24	40%
Ova-vegetarian	5	8%
Non-vegetarian	31	52%



Among all the subjects assessed, majority of them are non-vegetarians i.e.., 52%, followed by vegetarians i.e.., 40% and the rest i.e...8% are ova-vegetarians.

TYPES OF DIET ADVISED ON DISCHARGE:

TYPES OF DIET	NUMBER	PERCENTAGE
Normal diet	5	8%
Diabetic normal diet	10	17%
Warfarin diet	5	8%
Low salt diabetic normal diet	40	67%



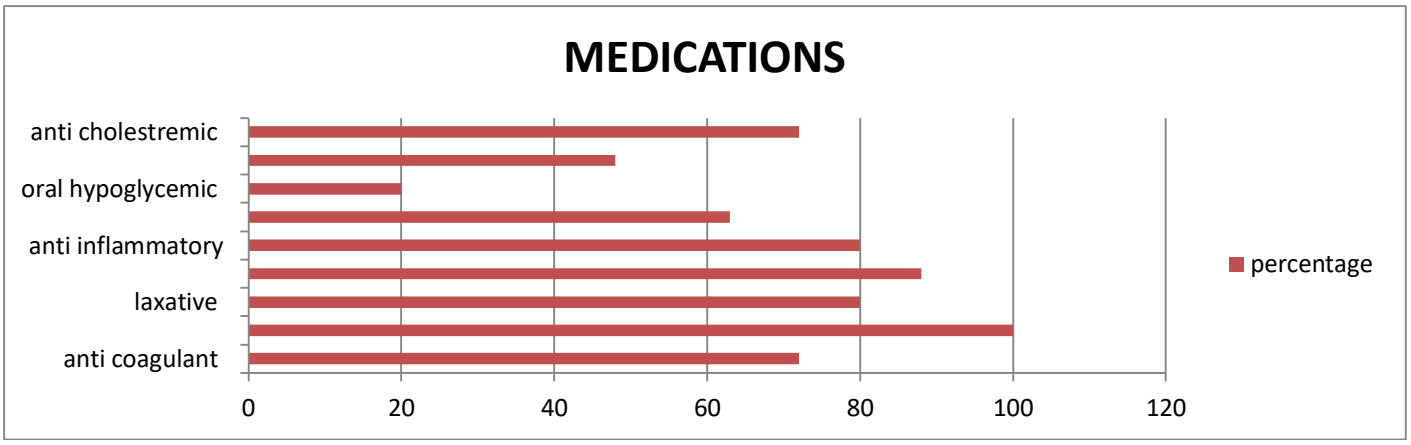
According to the data collected, 8% were advised normal diet, 17%-diabetic normal diet 8 % - warfarin diet, 67% low salt diabetic normal diet.

Warfarin diet is prescribed for patients who are on acitrom tablet which is a blood thinner. The diet restricts vitamin K rich foods. Majority of the subjects were advised low salt diabetic normal diet.

MEDICATIONS:

The various types of drugs prescribed to the patients are as follows:

CLASS OF DRUGS	NUMBER	PERCENTAGE
Anti coagulant drugs	43	72
Antacid drugs	60	100
Laxative drugs	48	80
Pain killer drugs	53	88
Anti inflammatory drugs	48	80
Anti cholestremic drugs	43	72
Anti hypertensive drugs	38	63
Oral hypoglycemic drugs	12	20
Vitamin and mineral supplements	29	48



According to the study, of all the subjects 100% were given Antacid drugs , 88% were given painkillers , 80% were given Anti-inflammatory drugs and laxative drugs , 72% were given Anti-coagulant and Anticholestremic drugs , 63% were given Anti-hypertensive drugs , 48% were given Vitamin and Mineral supplements and 20% were given oral hypoglycemic drugs .

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THE EFFECT OF PRE- PREGNANCY HIGH BMI ON MATERNAL AND FETAL OUTCOMES- FROM NUTRITION PERSPECTIVE

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ABSTRACT

Aim : To understand the role of nutrition in Pre - pregnancy High BMI and its effect on maternal and fetal outcomes.

Objective : To study the dietary pattern of Pregnant women with high BMI and to determine the role of nutrition on prevalence of high BMI and its impact on maternal and fetal outcomes.

Materials & Methods : This study was conducted among Pregnant Women attending antenatal clinic of one of the reputed maternity Hospital in Hyderabad. It was carried out on 100 pregnant women who were randomly selected in the antenatal clinic over a period of 2-months from January 2019 to February 2019. A structured questionnaire, which consisted of questions on anthropometric measurements, knowledge, attitude, and practices was employed as a data collection tool and their most recent medical reports were referred to check their biochemical parameters .

Result : It has been found in many studies that women who were falling under the category of overweight & obese before pregnancy were at higher risk of complications, in view of this statement the survey was carried out with 100 women with pre-pregnancy High BMI. The survey concluded that out of 100 women with pre-pregnancy high BMI, 60 were overweight and 40 were obese.

Out of which, 27 had GDM, 12 had Hypothyroidism, 09 had Preeclampsia, 15 had anemia, 14 had other complications like AKI, PPH, G.HTN etc..,

It was also seen that most of the women were non-vegetarians (64%), had a sedentary lifestyle (62%) and underwent Elective and Emergency Cesarean Sections (66%). Also the survey concluded that women gained more weight than the ideal gestational weight gain suggested by IOM according to BMI. 30% of Women gained ideal gestational weight, 14% of them gained less and 56% of them gained more than the ideal recommendations. Fetal complications were FGR and LBW which accounted to 28% and 26% respectively.

From the nutrition perspective it was seen that food groups like cereals, other vegetables and fats & oils were consumed by all the pregnant women (100%) on a daily basis, where as other food groups like green leafy vegetables, meat/chicken/fish, and fruits consumption on a daily basis was 39%, 41%, 55% respectively which is comparatively low. Also Milk & milk products were taken by only 73% of them daily.

Conclusion : From the present study it is found that pre-pregnancy High BMI and the dietary pattern has an impact on both maternal and fetal outcomes. High incidence of Cesarean sections, Gestational Diabetes Mellitus, Anemia, Preeclampsia, Hypothyroidism and fetal complications like Low Birth Weight and Fetal Growth Restriction were observed in women with a poor dietary pattern, sedentary lifestyle and High Pre-pregnancy BMI.

Keywords : High BMI, Nutrition, Food Frequency, Dietary pattern, Maternal Complications, Fetal complications, Gestational weight Gain.

INTRODUCTION : The increasing rate of maternal obesity provides a major challenge to obstetric practice. Maternal obesity can result in negative outcomes for both women and fetuses. The maternal risks during pregnancy include gestational diabetes and preeclampsia. The fetus is at risk for stillbirth and congenital anomalies. Obesity in pregnancy can also affect health later in life for both mother and child. For women, these risks include heart disease and hypertension. Children have a risk of future obesity and heart disease. Women and their offspring are at increased risk for diabetes. Obstetrician-gynecologists are well positioned to prevent and treat this epidemic. [1]

Increased incidence of stillbirths, abnormal growth, cardiac defects, and neural tube defects has been reported in the offspring of obese women after adjustment for various factors including age, familial and lifestyle factors, and ethnicity and. Furthermore, children born to women who enter pregnancy in an obesogenic state are at higher risk for several adverse long-term health outcomes including increased incidence of obesity , cognitive development deficits and ADHD , type-2 diabetes , cardiovascular disease , cancer , and greater all-cause mortality in comparison to children born to lean mothers.[2]

In 2009, the Institute of Medicine (IOM) released new recommendations for gestational weight gain, including specific recommendations for rate of weight gain by pre-pregnancy body mass index (BMI). [3]

MATERIALS & METHOD : This study was conducted among pregnant Women attending antenatal clinic of one of the reputed maternity hospitals in Hyderabad. It was carried out on 100 pregnant women who were randomly selected in the antenatal clinic over a period of 2-months from January 2019 to February 2017. A structured questionnaire, which consisted of questions on anthropometric measurements, knowledge, attitude, and practices was employed as a data collection tool and their most recent medical reports were referred to check their biochemical parameters. A formal permission to conduct the study was obtained from the authorities of the hospital and a verbal consent was obtained from women attending antenatal clinic. A structured interview schedule was used to collect the required information and their most recent medical reports were referred to check their biochemical parameters. A total of 100 pregnant women attending ANC clinic were randomly selected and included in the Study. All the registered pregnant women, those are attending the antenatal clinics were included in the study The data was analyzed using Microsoft excel.

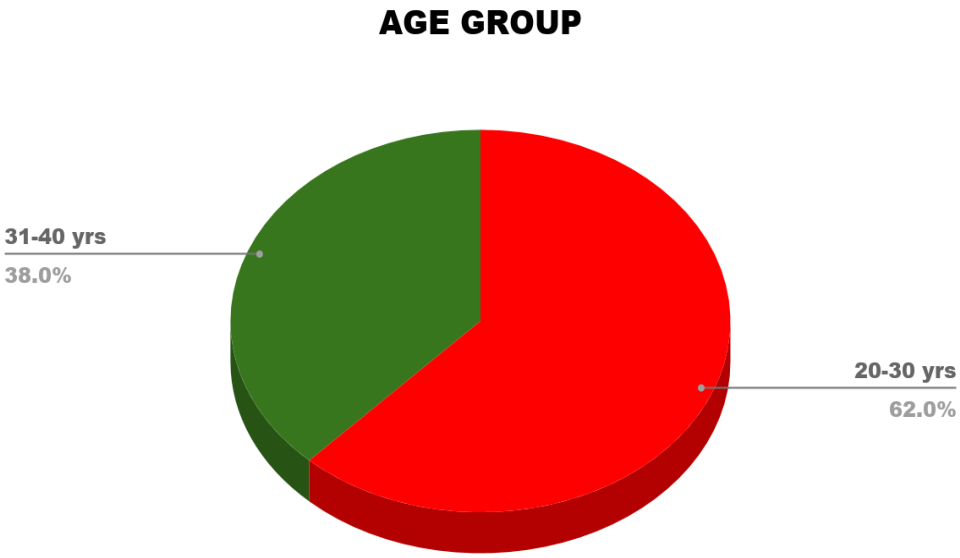
Result : From the present study it was found that 62% of women were in 20-30 year age group and 38% of women were under 31-40 years of age group. Out of 100 respondents, it was seen that 60% of the women were overweight, 40% were obese even before conceiving and 16% of them were overweight, 84% were obese at the end of the pregnancy. The study revealed that 62% of them led a sedentary life while 38% of them had a active one and the diet preferred by 64% was non-vegetarian where as 36% of the pregnant women preferred vegetarian. From the nutrition perspective and food frequency recall it was seen that food groups like cereals, other vegetables and fats & oils were consumed by all the pregnant women (100%) on a daily basis, where as other food groups like green leafy vegetables, meat/chicken/fish, and fruits consumption on a daily basis was 39%, 41%, 55% respectively which is comparatively low. Also Milk & milk products were taken by only 73% of them daily.

It was also found that 20% and 48% of pregnant women underwent Elective and Emergency Cesarean Sections respectively, where as 32.7% had normal vaginal delivery. Also the survey concluded that women gained more weight than the ideal gestational weight gain suggested by IOM according to BMI. 30% of Women gained ideal gestational weight, 14% of them gained less and 56% of them gained more than the ideal recommendations. Present study revealed that 27% had GDM, 12% had Hypothyroidism, 9% had Preeclampsia, 15% had anemia, 14% had other complications like AKI, PPH, G.HTN etc.., Fetal complications were FGR, LBW and Preterm birth which accounted to 28% , 26% and 22% respectively.

Result :

1. AGE GROUP:

Upon analyses of the data, 62% of the respondents were in the age group 20-30 years and the rest of them were in the age group 31-40 years.



2. PRE-PREGNANCY WEIGHT:

PRE-PREGNANCY WEIGHT	NUMBER (n=100)	PERCENTAGE
50-60 kg	18	18%
61-70 kg	32	32%
71-80 kg	30	30%
81-90 kg	20	20%

The above table illustrates that 32% of the pregnant women weighed in between 61-70 kgs,30% of them weighed 71-80 kgs,20% of them weighed 81-90 kgs and the rest 18% of them weighed around 50-60 kgs.

3. PRE-PREGNANCY BMI:

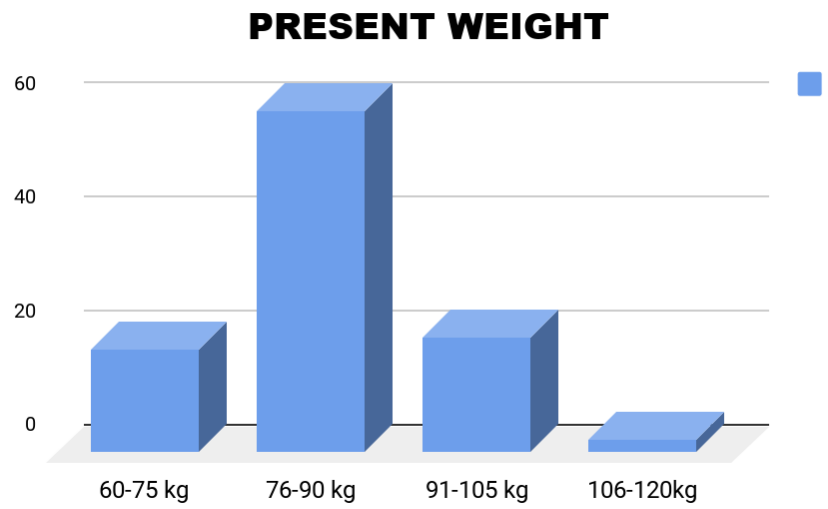
Among the 100 pregnant women,60% of the women were overweight at the time of conception and 40 % of them were obese.

BMI	NUMBER (n=100)	PERCENTAGE
OVERWEIGHT (>25-29.9)	60	60%
OBESE ($\geq$ 30)	40	40%

4. POSTNATAL WEIGHT:

Upon analysis of data,60% of the women had postnatal weight in between 76-90 kgs,20% of them were in between 91-105 kgs,18% of them were in between 60-75 kgs and the rest 2 % were around 106- 120 kgs.

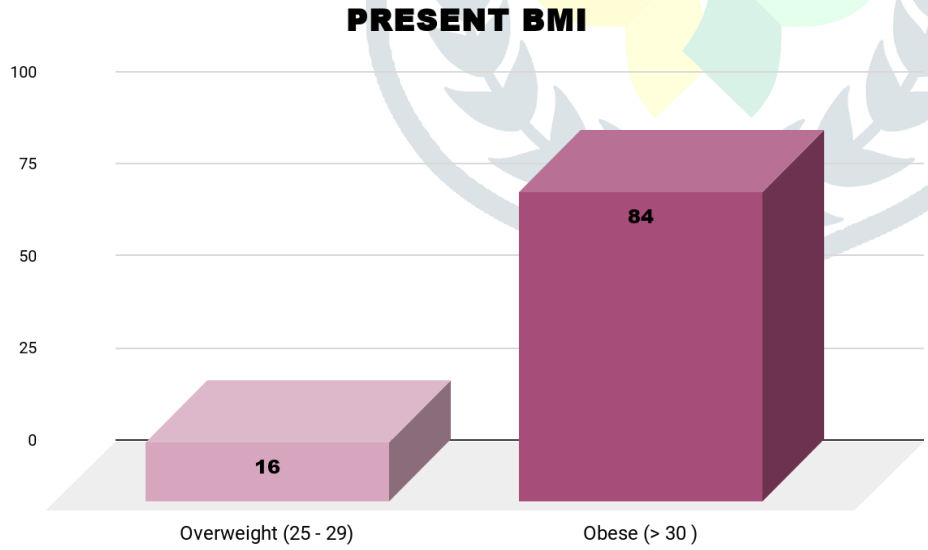
PRESENT WEIGHT	NUMBER(n=100)	PERCENTAGE
60-75 kg	18	18%
76-90 kg	60	60%
91-105 kg	20	20%
106-120kg	2	2%



5. POST-NATAL BMI :

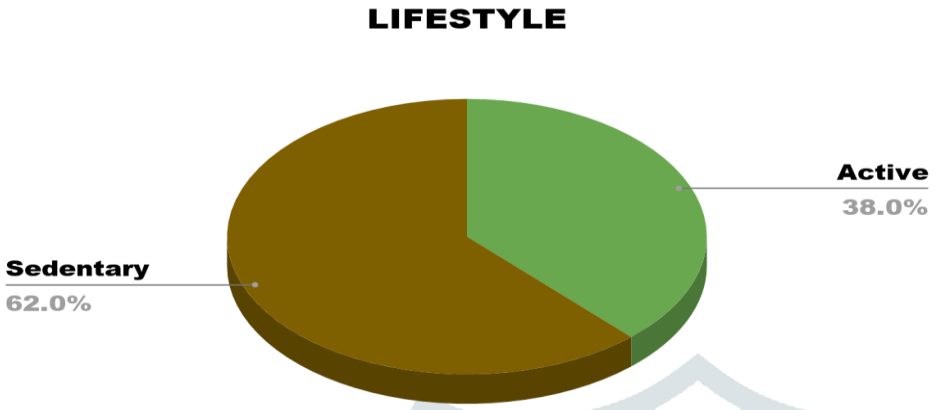
Among the 100 respondents,84 % of the women were obese and 16% of them were overweight.

BMI	NUMBER (n = 100)	PERCENTAGE (%)
Overweight	16	16%
Obese	84	84%



6. MODE OF LIFESTYLE

Upon analysis of data, the study conducted among 100 respondents 38% of the respondents were Active and 62% were sedentary.



7. DIET PREFERENCE

The patients were grouped into two types, based on the diet pattern and preference.

DIET PREFERENCE	NUMBER (n=100)	PERCENTAGE
Vegetarian	36	36%
Non-vegetarian	64	64%

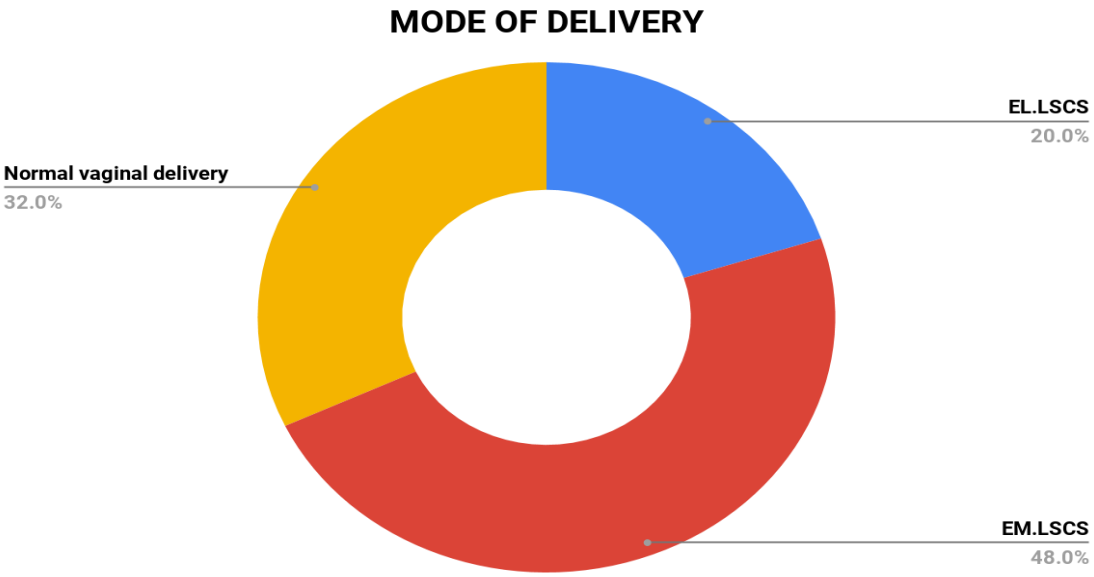
Above table illustrates that most of the high BMI patients were non-vegetarian i.e., 64% and only about 36% women were vegetarians.

8. FOOD FREQUENCY :

The table below illustrates that most of the pregnant women (100%) consume cereals, other vegetables and fats & oils on a daily basis, whereas, the consumption of pulses, Green leafy vegetables, fruits, milk & milk products and high biological value protein sources i.e., meat/chicken/fish daily is 47%, 39%, 55%, 73% and 41% respectively which is comparatively low.

Food Group	Daily	Weekly once	Weekly twice	Monthly
CEREALS	100 %	-	-	-
PULSES	47%	32%	15%	6%
GREEN LEAFY VEGETABLES	39%	43%	10%	8%
OTHER VEGETABLES	100%	-	-	-
FRUITS	55%	30%	8%	8%
MILK & MILK PRODUCTS	73%	10%	15%	2%
MEAT / CHICKEN/FISH	41%	28%	10%	21%
FATS & OILS	100%	-	-	-

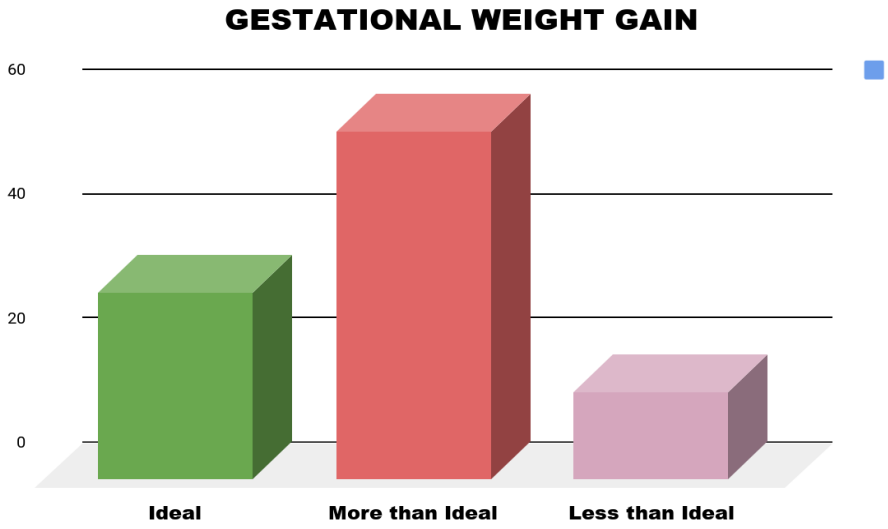
9. MODE OF DELIVERY



Above diagram illustrates that very few of the high BMI patients had a normal vaginal delivery i.e.., 32% and most of them underwent Em.LSCS & El.LSCS i.e., 48% and 20% respectively.

10. GESTATIONAL WEIGHT GAIN :

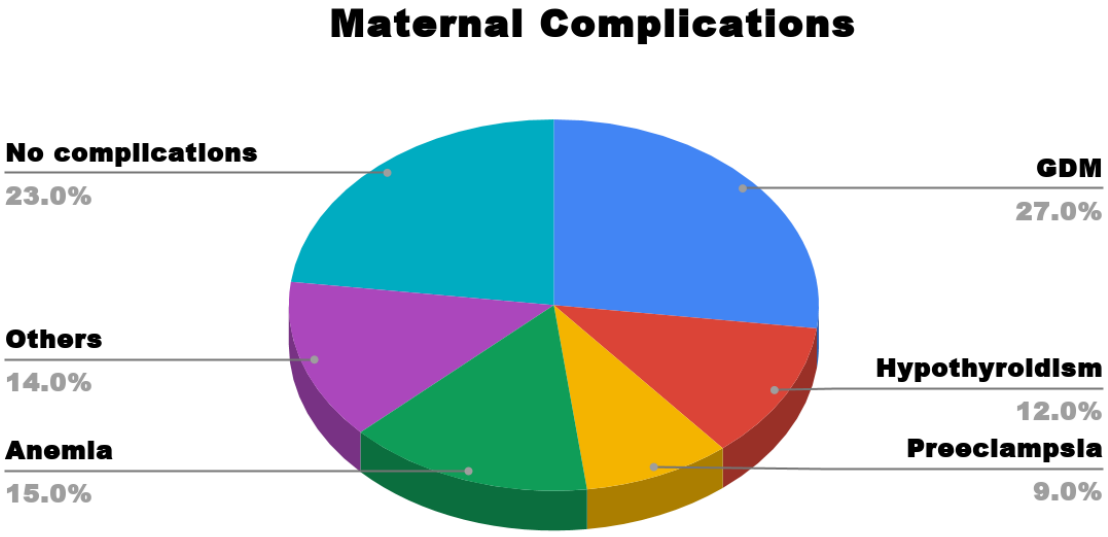
Among the 100 respondents,56% of the women weight gain was more than ideal,30% of the women gained ideal weight and 14% of them gained less than ideal weight.



11. MATERNAL COMPLICATIONS :

Among the 100 respondents, 27% of them had GDM, 12% had Hypothyroidism, 9% had Preeclampsia and 15% had anemia.
It was also seen that 14% of them had other complications like AKI, G.HTN, PPH etc..,

COMPLICATION	NUMBER (n=100)	PERCENTAGE
Gestational Diabetes mellitus	27	27
Hypothyroidism	12	12
Preeclampsia	9	9
Anemia	15	15
Other complications	14	14
No complications	23	23



FETAL COMPLICATIONS :

12. FETAL GROWTH RESTRICTION / STEROID COVER

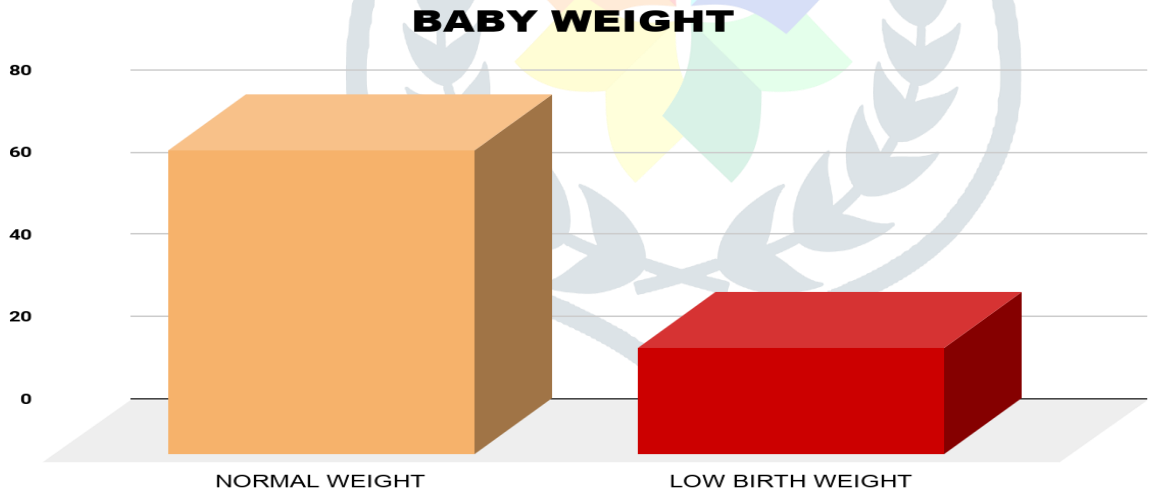
It was also seen in the study that 28% of newborn had fetal growth restriction and were given steroid cover.

FGR/ STEROID COVER	NUMBER (n = 100)	PERCENTAGE (%)
FGR/ Steroid covered	28	28%
No FGR	72	72%

13. BIRTH WEIGHT

From the study conducted, it was seen that 26% of the newborn had low birth weight and 74% had normal weight.

BIRTH WEIGHT	NUMBER (n = 100)	PERCENTAGE (%)
Normal weight (>2.5 - 3)	74	74%
Low birth weight (< 2.5)	26	26%



14. PRETERM BIRTH

Upon the analysis of the data collected from the case files it was found that 22% neonates were preterm and 78% neonates were full term.

TERM/ PRETERM	NUMBER (n=100)	PERCENTAGE (%)
Full term babies	78	78%
Preterm babies	22	22%

Discussion & Conclusion: The health of women, throughout their childbearing ages, should be addressed, to improve their obstetrical and perinatal outcomes. Also, the high risk groups should be managed at tertiary centers.

During the last two decades, there has been an alarming rise in the incidence of obesity all over the world. India is now facing a double burden of this disease with under nutrition and underweight on one side, and a rapid upsurge in obesity and overweight, particularly in the urban settings on the other side. [4]

Maternal obesity is now considered one of the most commonly occurring risk factors seen in obstetric practice. Compared with women with a healthy pre-pregnancy weight, women with obesity are at increased risk of miscarriage, gestational diabetes, preeclampsia, venous thromboembolism, induced labour, caesarean section, anaesthetic complications and wound infections, and they are less likely to initiate or maintain breastfeeding. [5]

The worldwide prevalence of obesity has increased substantially over the past few decades. Economic, technologic, and lifestyle changes have created an abundance of cheap, high-calorie food coupled with decreased required physical activity. We are eating more and moving less. [6]

The present study found that 60% of the women were overweight and 40% of them were obese even before pregnancy due to false dietary habits and low dietary intake of certain food groups which had its impact on maternal outcome as majority of them had Cesarean sections(68%) and other complications like GDM(27%), Hypothyroidism(12%),Preeclampsia(9%), Anemia(15%) etc.., Thus Results of the present study indicate that knowledge, attitude, food habits & practices of the pregnant women on healthy eating and nutrition should be improved and that health and nutrition education of the pregnant women is necessary for a healthy & safe motherhood. Awareness among women on starting a pregnancy with a normal BMI should be widespread.

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Religious Architecture and Art in South India

Meeta J

Introductory

The extent to which art and architecture develop in a society will be the extent to which the society as a whole will be considered talented. Even such ancient societies like the Egyptian, Mesopotamian. Chinese, Indian and Greek are famous in History for their attainments in the field of art. Art includes the fine arts and architecture is also an art but it is generally distinguished because of its special nature. Sculpture, painting, music, even poetry are usually treated as fine arts but architecture has its own dimensions which give it a spacious personality. Every art is associated with science. Music with the physics of sound, painting with perspective vision, literature with linguistics; similarly architecture is controlled as well as assisted by engineering. So a society which is advanced in the arts can be seen to be proficient in the sciences also. It has been therefore truly stated that architecture is the matrix of civilization. The architectural remains are the main visible records of men through the different ages of his historical evolution. When historical records fail us either on account of their scarcity or their doubtful nature we may find architecture a useful auxiliary in elucidating many obscure matters of history.

We notice different styles of architecture in the world and they differ from one another in fundamental principles and details. To the Greeks, architecture was refined perfection. Human buildings are characterized by scientific construction. Indian architecture is marked by certain features which are sui generis. First, one is struck by its spiritual content. The main purpose of the building art in India is to represent in concrete form the prevailing religious consciousness of the people. It is the objectification of mind in terms of rock, brick, mortar or timber. Secondly, the development of Hindu architecture has been mainly regional and therefore the building style was moulded by varying local conditions which were themselves the product of the availability of building material. Thirdly, Indian architecture has grown depending heavily upon the evolution of religious ideas. The extent to which the various religions in India have depended on one another for their doctines and practices has also been the extent to which the different types of architecture like the Buddhist, the Hindu, the Jaina have influenced one another. Broadly speaking it was right for Fergussion to speak of Buddhist, Hindu etc., styles of architecture. The differences come because of the special needs of each religion. The medieval Hindu temple depends for its architectural style on the agamas, which are the quintessence of the religious formalities. Hindu architecture not only religious, but even secular is conditioned by the principles of life accepted as basic by that society. Above all even as material decided construction, climate also decided it. Though normally secular structures are characterized by considerations of utility and religious structure by religious symbolism the latter cannot be free from utilitarian considerations and the former from artistic feelings. Even secular structures, it was believed must have aesthetic qualities.

Origin of Religious Structures

Speaking of Hindu architecture as a whole there has been much difference of opinion regarding its origin. Some hold the view that Hindu religious edifices were the product of native tradition; others hold that it was influenced by foreign example. The arguments usually mentioned to support the indigenous theory are as follows:

1. Some of the important parts of the Hindu temple are (i) the kudu (ii) the vaulted roof (iii) the pyramidal nature of the sikhara. It is suggested theat since the kudu has its counterpart in the Buddhist sun-window, the vaulted roof resemble the Buddhist chaityas and the pyramidal sikhara resembles the diminishing story of the Buddhist monastery. Hence it is reasonable to suppose that the Hindu temple has grown out of the Buddhist religious edifices.
2. The temple has been derived from the graveyard. In the Hindu pantheon, there are two kinds of deities; (i) the older ones even now worshipped in villages more out of fear than love and given attricutes of ferocity and vengefulness and in fact more appeased than worshipped, and (ii) the more sophisticated ones obtaining an elaborate system of worship based on love. The village Gods, or at least most of them, are represented by triple stones generally hedged in by a circle of stones. The megalithic system, of burial and the stupa style go together in basic conception. It is also significant that some deities like siva are associated with the crematorium and with the ashes and skulls found there.
3. Even as the house was a derivative of the natural hollows in trees and caves in rocks, the temple itself was derived from the house. This was later sophisticated further by equating the chief resident in the temple and the head of the household, especially when the latter happened to be a king; so that Ko in Tamil means king as well as God and Koli means palace as well as temple.

Those who derive the Hindu temple from foreign sources attribute it to Egyptian influence referring to the Egyptain temples of about 1200 BC. These temples also had their gateways, walls, pillars, halls, sanctum etc.

Most of the religious edifices in ancient India are either circular, square, semi-circular or apsidal in shape and these shapes may have (or may not have) religious significance. It is customary for some scholars to derive the shapes of temples from the three types of sacrificial platforms (fire altars) known to vedic practitioners. But this ought to be treated as far-fetched, since the vedas themselves have no notion of worship in temples.

A study of Indain architectures is, so far as the Hindu period at least is concerned, the study of temple architecture. Another way of expressing this is to say that the Hindus neglected secular architecture. The temple architecture itself does not straightaway appeal as an object of beauty to a mind unaccustomed to the tradition which created the temple; for in the Hindu temple there is a lot of symbolism which apart from the symbolism may have not meaning or appeal; and the religious symbolism is esoteric and unintelligible to the uninitiated. Some say that the Hindu temple is a microcosm, a kind of magic replica of some unseen region or sacred being; "The

proportions or motifis employed are governed by this mystic necessity to conform to an ideal pattern calculated to secure full harmony of the structure with the cosmos that it reproduces." This statement could be the essence of spiritual wisdom in the context of the temple or mere bombast. It is possible to give symbolism to the temple and then say that the temple symbolizes it.

The Stupa

The religious buildings of ancient Indi may be chronologically classified under three of a burical or tumulus enclosing within it the relices of the respected dead. It is commonly associated with Buddhism and Jainism, more particularly with the former, and Buddhist stupas have been found in many places in india, as also in Ceylon, Burma Indonesia and China. Stupas, are of three kinds, sariraka stupas enshrining bodily relics of particularly the founders of religions, paribhogika stupas erected over the articles such as the begging of bowl or staff of such persons and pariyatrika stupas which were erected over spots visited by the founder or his disciples.

The most important part of the stupas is the hemispherical dome. It is surmounted by a squane railing called harmika which encloses, one or more shafts of the crowning umbrella. The dorne is supported by one or more cylindrical or square plinths. There are also railings enclosing the perambulatory passages. While the earlier stupas were just hemispherical with a low base the later stupas took it more cylindrical form. The decorative elements also were multiplied

The South Indian stupas are characterized by the lion pillars at the gateways and the five ayuka pillars standing on each of the projections at the four cardinal points. The dome of the Ceylon stupas is bell shaped. The cardinal points have architectural projections. They have rows of stone pillars, apparently for carrying a roof over the stupa. Beside, there are seen moonstones and figures of Yakshas carrying a puranaghata.

The earliest examples of stupas in South India are found at Amaravati, Nagarjunakinda, Bhattipolu, Jaggayapeta, Salihundam and a few other places. The stupa at Amaravati was dismantles by a local zamindar in the last century, but pnels of stones containing sculptures while the others are now in the British Museum, London, and the Government Museum, Madras. The sculptures at all the places are either in marble or sandstone.

The Viharas and Chaityas

The next type of religious edifices gets better representation in South India. They are usually called cave temples and are found in the Deccan. They are Buddhist. There are two types among them namely viharas (monasteries) and chaitya halls. The vihara had a verandiah in front. It was a big hall with square cells cut in the rock to accommodate asceties. The chaitya on the other hand was a vaulted congregation hall with an apsidal back, and a rock hewn stupa at one end. It is divided into a nave and side – aisles by rows of pillars. Light and air are let in through windows over the door – ways. The earlier chaityas which were Hinayanist in character bear less ornamentation and are imitative of wooden modles. In fact wooden girders are used in some of them. In later chaityas there are found sculptures particularly on the tops of pillars. The most important among them are those at Nasik and Karle. Probably they may be assigned to the first

and second centuries AD. The viharas of a later period contain a shrine chamber with a pillared assembly hall in front. Buddhist images were carved on the walls. Though in the earlier stages the viharas were single storeyed, caves with two or three storeys were made in later times. Some of the caves of Ajanta are of this variety. Though most of them were Buddhist caves some were Brahmanical also. Most of these caves are found in the Western Ghats which were probably very well suited for such excavation. The traditions of excavation continued till about the tenth century. The places when these caves are found are Bhaja, Bedsa, Junnar, Karle, Elephanta, Kanheri, Nasik, Ajanta Ellora, Auangabad, Ter, Chezarla etc. The earliest examples of the temple architecture in the Deccan are seen in the temple complex at Aihole, Pattadakkal and Badami.

In the Tamil country as also in south Andhra Pradesh there appear to have exist contains numerous references to temples, deities consecrated in them and the festivals conducted in their honour; but unfortunately those temples do not exist now. Most probably they were made of perishable material like wood and therefore they perished in couse of time. It is not even easy to get any clue with regards to their shape or size. However, the bas reliefs from Amaravati, Jaggyapet, Nagarjunakinda and Goli contain different examples of architecture which include figgerent types of religious shrines and they may probably be able to suggest the types of religious edificies that existed in early south india. In early Hindu religious structures stone was not used. No Hindu stone monuments rock-cut or structural are found in the Tamil Country dating from a time anterior to the sixth century AD, though the stone had come into use as may be seen from the Yupas (sacrificial posts) in distant Bomeo, even a century earlier.

But the need for the use of the permanent medium of stone in the making of temples was realized more and more and stone came to be used in such construction in South India from about the beginning of the 7th century. The first king associated with the practice of making temples of stone in the Tamil country was Mahendravarman I (c 580-630). The period of the Pallavas was probably the most creative epoch in the history of South India which was marked by the revival of Saivism and Vaishnavism led by an efflorescence of literary activity and development of art, architecture, sculpture and painting, though on the political side it was marked by frequent wars between the pallavas, pandyas, gangas and the Western Chalukyas and later the Rashtrakutas and many minor dynasties that rules over different parts of South India.

Evolution of temple architecture

Mahendravaraman who calls himself Vichitrachitta (curious of inventive minded) extols himself for the achievement of the excavation of cave temples without using brick, morta, metal or wood. The temple architecture that was thus started in South India had a continuous history since then. It is generally classified into group according to the names of the dynasties of kings. It's usually said that the pallavas period (AD 600 – AD 850) is that of sculptured rock, the early Chola period (AD 580- AD1100) that of grand vimanas, the later Chola and Imperial Pandya period (AD 1100 – AD 1350) that of the most beautiful gopuras end of the vijayanagar period (AD 1350 – AD 1600) that of mantapas and pillared halls and the Nayak period as also the modern period after 1600 as that of corridors.

Mahendravarman excavated in living rocks a number of cave temples which are simple in their plan and decoration, each of them consists of a pillared verandah in front and a shrine cut into its back. The pillars are thick and not more than seven feet in height. They are divided into three sections, the lower and the upper ones being cubical squares in shape and the middle one octagonal, being beveled on four sides. The two sadurams are ornamented by engraved lotus medallions. The extreme columns are pilasters. In some cases the front verandah consists of two parts of the Mahamantapa and the Ardhamantapa. Each cave temple has one or three or five cells or shrines cut in the rock. On the top of the pillars and pilasters are placed massive potikas or corbels. The kudu arches are found engraved on the Kapota in a few cases. On either side of the entrance to the cells in some of the caves are found sculptured figures of two dvarapalakas. Such cave temples were excavated during the days of Mahendravarman's successors also, namely Narasimhavarman I, Paramesvaravarman I, and Narasinhavarman II. The general architectural feature of these temples are practically the same as those of the earlier ones, except for the fact that the pillars are found to be thinner and taller, sometimes flatter with an oblong section. The space between them is wider. During the days of Narasimhavarman II (AD 630 – AD 668). This rock- cut cave architecture reached it zenith in the Tamil country. The best examples this group are confined to Mahabalipuram and are characterized by greater advance with regards to their components and general execution. "On their façade is a roll cornice ornamented with a kudu motif which is surmounted by a parapet formed of model shrines a long one alternating with a short one. The mural surgace between the pilasters was utilized for the carving of edifying sculptures. The pilasters were utilized for the carving of sculptures. The pilasters of some of the mantapas are also adorned with sculptural figures of high quality. Among them particular mention may be made of Durga slaying the buffalo demon Mahisha, Krishna raising the govardhana, Vishnu as Anantasayin and the incarnation of Vishnu as Varaha.

The Rathas

The period of Narasimhavarman also saw the excavation at Mahabalipuram of a new type of monolithic temple known as rathas which were really rock –cut models of structural temples. They are nine in number and of them five are named respectivelyu after the Pandava brothers, while the other four are respectively called Ganesaratha, Southern Pidariratha, Valaiyankuttai ratha and northern pidari ratha. "The rathas have a unique significance in the history of Indian art and architecuture. Abounding in immense architectural potentialities and adorned with sculptural art of a trulu classical quality, these monuments not only laid the foundation of the South Indian architecture but influenced to a considerable extent the development of art in the islands of Indonesia." The Draupadi (Durga) ratha has the shape of a thatched hut. The Arjuna ratha is a more developed structure and anticipates the later examples of temple Vimanas. The Sahadeva ratha has an apsidal plan. The Bhima ratha has the shape of a wagon and is the predecessor of the gopuras of later times. The Dharmaraja ratha has three storeys. The pillars of these rathas ar comparatively very slender, and have seated lions at their base.

Structural Temples

From about the end of the seventh century i.e., from the days of Narasimhavarman II, structural temples came to be constructed. They are usually grouped under two heads, the pre-Rajasimha group (C.600-700) and the Rajasimha group (C.700-800) . Among the temples in the former group there are three at Mahabalipuram, two at Kanchipura and one at Panamalai. The first of these is the Jalasayanesvara temple usually called the shore temple at Mahabalipuram. This cynosure of the mariners has evolved a beautiful and rhythmic Vimana. The temple is charactersed by its pillars with rampant lions, the prismatic Linga in the sanctum facing the sea and the surrounding wall which is surmounted by couchant bulls. Pallava art reached its maturity in the temples of Kailasanatha and Vaikunthaperumal both at Kanchipuram. The main building of the kailsanatha temple has again a pyramidal sikhara which became the distinctive feature of the Dravidian architecture. It is also noted for its beauty of decoration and numerous puranic sculptures. The Vaikunthaperumal temple which is the most integrated temple of the period displays an economy in the disposal of its parts together with a skillful marshalling of the main element so as to produce a unity of conception, which has resulted in a building having considerable architectural merits". The pillars in this temple show seated lions at their base and palagai or cushion capital at their tops.

Towered Temples

The later pallava period was not marked by the construction of really attractive temples. But during that period temple architecture developed in the Chola country and a number of structural temples were constructed. They are dominated by the Vimana rising over the garbhagriha or sanctum. All these are small. But they are very compete in their formation and display a freshness and spirit in marked contrast to the last production of the declaring style of the pallavas. So much so they appear to herald either a new some stimulation received from another source. All the temples in the group shows by their treatment a close affinity to those of the more distant chalukyas than to their predecessors, the pallavas. Most of the temples of this period are found in the present Tanjore and Tiruchirapalli district though some are found. The construction of subshrines in the main temple because a characteristic feature of this period. The capital and the abacus undergo some changes.

The period of the imperial Cholas was easily the golden age of temple construction in the Tamil country and South Indian art reached its highest watermark them. The number of temples constructed during this period was large and they are found in different places in south India. The two great temples respectively at Tanjore and Gangarikondacholapuram (the letter a dilapidated village in the Tiruchirapalli district) are the most developed and representative of the Dravidian style of architecture and compared to the smaller temples of the same period they are as cathedrals to village church. The great temple of Brihadisvara at Tanjore was begum by Rajaraja I in 1003 and completed about 1010. The temple covers an areas of 500 feet by 250 feet. The Vimana which of dominates the temple rises over the garbhagriha to a height of 190 feets. It consists of three parts. A vertical base covering an area of 82 feet square rises perpendicularly to a height of 50 feet is surmounted by a pyramidal body in thirteen diminishing

tiers and is crowned by a huge monolithic bulbous dome composed of a single block of stone. Over the dome is placed a puraghata or Kslast of stone. "This great temple of Tanjore is really the finest single creation of the Dravidians craftman; the Tanjore Vimana is also a touchstone of Indian architecture as a whole".

The temple at Gangaikindacholapuram which is called the feminine counterpart of the Tanjore temple was constructed by Rajendra, the son of Rajaraja within twenty years after the construction of the latter, and contains many of its characteristic features. It forms a rectangle 340 feet along and 100 feet wide. Inside the temple are a big mantapa measuring 175 feet by 95 feet and a garbhagriha with a square plan of 100 feet side. The tall vimanas over the sanctum rises to aheight of 160 feet and contains rich curves instead of the straight lines which mark the façade of the Tanjorre tower. Each is the final and absolute vision of its creator made manifest through the medium of structural form, the one symbolizing conscious might, the other sub-conscious grace, but both dictated by that "divinity which has seized the soul".

Later Chola Structures

Two more temples of the Chola period deserves mention here: the Airavatesvara temple at Darasuram and the Kampaharesvara temple at Tribhuvanam, both in the Tanjore District. While the former marks in many ways the transition from the full plenitude of the Chola style as seen in Tanjore and Gangaiknodacholapuram to the great temple complexes of post-chola epoch; the latter as a whole is a veriable sculpture gallery of varied iccnography and is the last temple to preserve the predominance of the Vimana characteristic of the chola style of architecture. The images that were made during this period were those Nataraj, various aspects of Siva, Brahma, Sapta-matrikas, Sita etc.

The Pandyan Style

The significant feature of the temples of the Pandya period is the dominance of the monumental gateway or gopuram at the entrance to temples which dwarfed the Vimana over the central sancturary. These gopurams were treated with rich plastic decoration and were surmounted by a barrel vaulted roof with gable end originally derived from the example of the Buddhist chaitya hall. The gopura in the second enclosure of the temple at Jambukesvaram near Tiruchirapalli and the eastern gopura of the temple at Chidambaram contain characteristic feature of this development.

The Hoysala Style

During this period another type of architecture developed in the Karnataka country under the Hoysalas. Hence it is called the Hoysala style of architecture. In the construction of the Hoysala temple a dark stone of a very fine grain was used. The temple example of which are found n Halebid, Belur and Somanathpur are all structed on star-shaped for polygonal) plinth built in triplicate or guadruplicate tiers.

The shrines are surrounded by a high and broad pradakshina patha. The temple have an excellent finish and contain many exquisitely carved sculptures.

Portraits

In south India a number of portrait sculptures are found. In the Varaha cave at Mahabalipuram are two sculptured royal male figure each with their two queens. Below each of the male figures there is an inscription. One reads "Sri Simha Vinna Pottratirajan: and the other "Sri Mahendra Pottratirajan". They have been identified in three different ways by scholars. The scuptures are typical of the excelled attained in the art of portraiture under the pallavas. The chola sculptors excelled their pallava counterparts in portraiture as is testified to by the brilliant pieces of art at Srinivasanallur and Kumbakinam. The portrait of Tirukkarrali-piccan in the temple of Tiruvaduturai which indicated the realistic reproduction of the facial traits practiced by the artists of the tenth century, and the beautiful bronze stature in the Kalahasti temple representing Cholamadevi, the queen of Rajaraja I are respectively considered to be the earliest dated portrait and metal images of the Chola period. However this art was never seriously practiced in South India.

Painting

The art of painting both monochrome and polychrome is very old. The earliest surviving examples in India date from the first and second centuries BC and are seen in the caves at Ajanta which however are not frescoes. The themes of these are dominantly Buddhist. The painting help us to understand some aspects of the religious and social life of the people.

In south India literary evidences testifying to the extent and excellence of early murals are extensive but our knowledge of them is still meagre since none of the specimens survives. The cave temples of Tirumayam and Mamandur and the Structural temples of Panamalai, Kanchipuram and Mamallapuram contain fragmentary Pallava painting which may be dated the seventh and eighth centuries. The paintings in the cave temples at Sittannavasal are attributed by some scholars to the pallavas. But some consider them to be the pandya origin. Of the Chola painting the most significant and representative ar those in the circumambulatory passage roung the sanctum of the Tanjorre temple, first brought to our notice some twenty-five years ago. This art was continued and given imperial patronage in the Vijayanagar period also; but still some decline in the art was not imperceptible. A few surviving examples of it worth mentioning are found today at Hampi, Somapalle, Lepakshi, Tirupparuttikunram, Aneguudi and Kanchipuram.

The south Indian painting Is technically different from the famous paintings of Ajanta, Sigiriya, Bagh, Badami and Ellora."Here the Ground Plaster is of coarser lime mortar below, with a finer coat of lime wash above it on which the pigments have been laid. The absence of any adhesive such as gum or glue in the laying of the pigments is the important feature that distinguishes them from the paintings in the Deccan and Ceylon".

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Latest Trends in Foreign Language Teaching Learning and Curriculum Designing | *Original Article*

— Nishath Fatima*, in *Journal of Advances and Scholarly Researches in Allied Education | Multidisciplinary Academic Research*

ABSTRACT:

Arabic language is being taught in the Indian sub-continent for the past several decades and has now found its place in various Universities of India and in other related academic fields. Arabic language has now become an International language, being spoken in several countries both as native as well as a second or foreign language. From the early eighth century, Arabic in India has borne an Islamic identity, which has continued to be elaborated and strengthened through the thirteen centuries of its use under Muslims and British rule. Presently, in India, Arabic language is also being taught and learned in more than twenty thousand Madarsas, mostly in Northern and some Western parts of India. Deobandh and Nadva-tul-Ulum has emerged as the major centers of learning of Arabic language in the form of recitation of Quran and Hadith. These centers of Arabic learning are now also offering post graduate and graduate courses in the teaching of Arabic language. The present paper tries to explore the place and scope of Arabic language in the higher education system of India and the impact of teaching and learning Arabic language on other languages.

Robotic Process Automation (RPA) - A Business innovations at Capgemini Company

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Abstract

Business innovation often results when ideas are applied by the company in order to further satisfy the needs and expectations of the customers. Banks, Financial Institutions and Insurance companies are transforming core operations to address significant industry disruptions from ***FinTechs and Digital***. Optimizing operations and improving efficiencies means more than just upgrading systems or outsourcing processes—it means innovation. One way to innovate is by using Robotic Process Automation (RPA) to improve the speed and accuracy of core business processes. Robotic Process Automation (RPA) is an emerging software based solution to automate rules-based business processes that involve routine tasks, structured data and deterministic outcomes. RPA technology adds impetus to business innovation and profitability. It enables organizations to configure software. RPA is also enhanced, augment and compliment human abilities such as big data, IoT /sensors and mobile devices. As RPA continues to bloom, India is in a fantastic position to emerge a front-runner in the establishment of the industry and benefit greatly from this opportunity. Government has invested 13$ billion in robotics under its ***Make in India*** initiative. Implementation of RPA from a country perspective, the US (26%), France (21%) Germany (17%) and India (15%) are at the forefront of adopting automation technologies. The structure of the paper intends to analyze the recent trends and growth in financial service industry with a special focus on the evolution of RPA in the Capgemini Company. Capgemini has successfully delivered more than 30 successful RPA implementations, automating more than 800 processes. Through implementation of RPA in business policy process capgemini has gained the following benefits in reducing FTES by 50% and increasing in efficiency from 30% to 40%.

Keywords: Robotic Process Automation, Business Innovation, FinTech

INTRODUCTION

Robotic Process Automation

Robotic Process Automation is the next wave of innovation, which will change outsourcing. We already are seeing the beginnings of a race to become the top automation-enabled service provider in the industry. In time, we are likely to see an arms-race for innovation in automation tools leading to new offerings and delivery models. The term "Robotic Process Automation" connotes visions of physical robots wandering around offices performing human tasks; the term really means automation of service tasks that were previously performed by humans. Businesses across the board are realizing that RPA is the next significant digital transformation that will enable employees to stop working on repetitive tasks. Robotic Process Automation allows employees to concentrate on more value-adding initiatives, which are imperative for the bottom line of the firm.

Objectives

1. To explore and analyze Robotic Process Automation **(**RPA) in India.
2. To give insights into Phases of RPA.
3. To investigate and present the benefits gained by adopting RPA at Capgemini Company

Robotic Process Automation (RPA) in India:

The Prime Minister Narendra Modi unveiled the future Skills form that aims at up-skilling two million technology professionals and skilling another two million potential employees and students over the next few years.

Eight technologies, identified in a survey by NASSCOM and the Boston Consulting Group, are part of the "Future Skills" platform. It includes **Robotic Process Automation** alongside AI, Virtual Reality, Internet of Things (IoT), Big Data Analytics, 3D Printing, Cloud Computing, Social, and Mobile, as part of the Future Skills Platform.

According to HFS Research, the global market for RPA Software and Services is expected to grow to $1.2 billion by 2021 at a compounded annual growth rate of 36%, from $271 million in 2016. Today, RPA deployment is a buzzword.

Robotic Process Automation (RPA) in Indian Market:

The Indian market for RPA is broadly segmented into:

Large IT services organizations who are leveraging RPA to reduce costs of delivery and passing the benefits to their clients; Captives of global companies that have grown by offering data-centric process management activities and now have to reduce costs to ensure cost structures are optimal and Indian corporate that are still at the RPA POC (proof-of-concept) stage. Indian companies are expected to see large-scale adoption of RPA

Government-led RPA Boom

The government's Make in India and Digital India initiatives have set the ball in motion a few years back. But to take India's digital transformation to the next level and attract greater FDI into the country, more needs to be done. Again, aiming to emulate the China model is a sound strategy. The realm of automation is one that is open for India to capitalize on and we're seeing several initiatives already make a difference.

In 2018 Union Budget, Finance Minister Arun Jaitley even announced plans to double the budget allocation for Digital India to INR 3073 core. Allied with a strong focus on emerging technologies such as robotics, AI, digital manufacturing, Big Data analysis and IoT, this holds promise for India's impact as an automation hub.

The commerce and industry ministry consciously realize the need for policy changes to drive macroeconomic change in the technology space. This is leading to a scenario wherein businesses are increasingly open to adopting new technology for traditional processes.

Automation is the most adopted technology right now, owing to its many benefits and cost-saving attributes for companies of all sizes. With government re-skilling programs such as Future Skills also preparing the workforce for this change, it's clear that government policies are creating an environment that can propel India to the front of the software automation, RPA.

Analysis of life cycle of Robotic Process Automation (RPA) in 4 Phases:

Phases –I Analysis

Life cycle in RPA begins with analysis phase. Business team and RPA strategist/Architect work together to identify a business process for RPA development.

- Most of the development follows an agile methodology that too is customized (some modifications) agile.
- The core intent of this analysis is to identify processes which are feasible for automation, as well as can save manual effort and bring ROI.
- Once after finalizing the process, planning of work that includes resources and time identification is being formulated with the help of an RPA lead.
- A formal approach is being documented and after approval from all stakeholders development is started.

Phases -II Bot Development

RPA developer (Team) starts working on requirement in their environment possibly a separate development environment.

- Most of the development is wizard driven, with limited or no coding/scripting effort required.
- However there are cases where RPA tools have limitation and coding needs to be done.

Phases-III Testing

There are two approaches on which testing is being carried out-

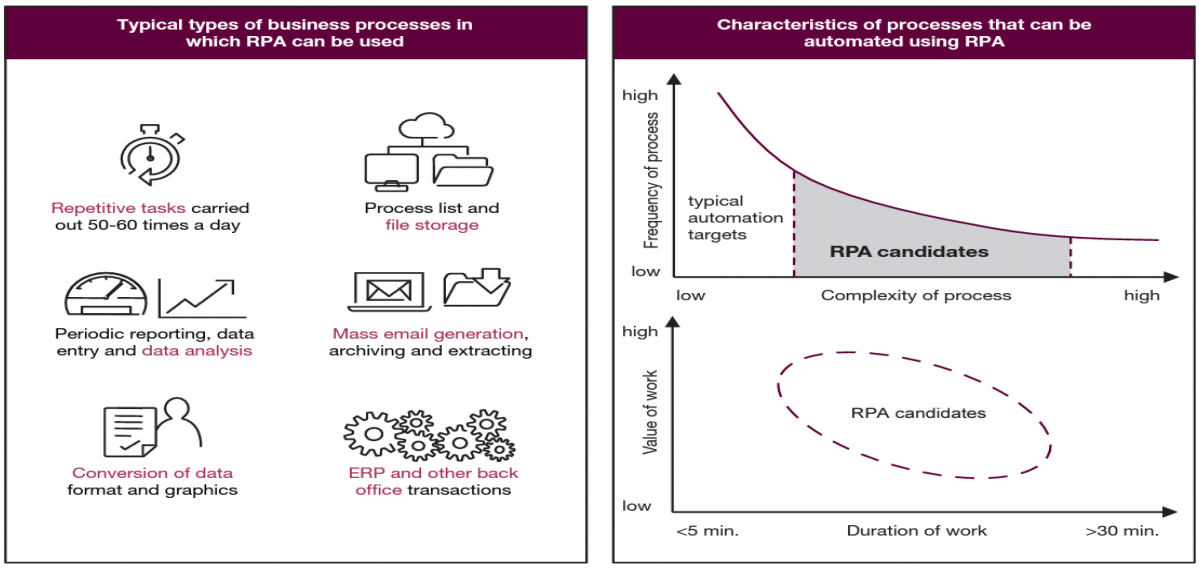
a- Separate Testing Team.
b- Testing done by RPA dev team only.

- Some of the organization believes that Unlike SDLC-software development life cycle in RPA testing is not that extremely critical part in most of the organization, therefore, script correctness is verified by the development team usually, with a peer review and once it is done same is ready for deployment.
- While other few have a dedicated testing team which perform a dedicated QA like normal SDLC flow.
- Best Practice is to have a dedicated testing team which performs QA of developed bot.

Phases-IV Deployment and Maintenance-

- After the Dev and testing closure, a bot is ready for deployment and enters maintenance phase.
- Whenever a change comes in a process script/bot is updated or in a case, any issue is being caught in a bot same is being re-deployed by following the development-test process again.

Types of business processes in which RPA can be used



Source: A report from Capgemini Consulting

Robotic Process Automation is undoubtedly the next wave in digital transformation—RPA is a software application that can replicate processes humans would do to move information through and between different technology systems. Robotic automation uses software as a virtual FTE to manipulate existing application software (e.g. ERPs, CRMs, and claims applications) in the same way that a person completes a process.

What is particularly revolutionary about robotic automation software is that it does not necessarily require companies to make changes to their strategic processes or existing back office technologies. Even if companies are separated geographically or have various technological systems implemented, RPA is able to connect systems. Therefore, RPA may function as a quick win solution for process optimization.

While knowledge-based automation tools and cognitive artificial intelligence systems are entering the market, the majority of companies are currently focused on rules-based robotic automation solutions, which means that RPA can work well with complex processes that have a specific set of repetitive rules. Rules-based tasks.

Companies and their interest in RPA

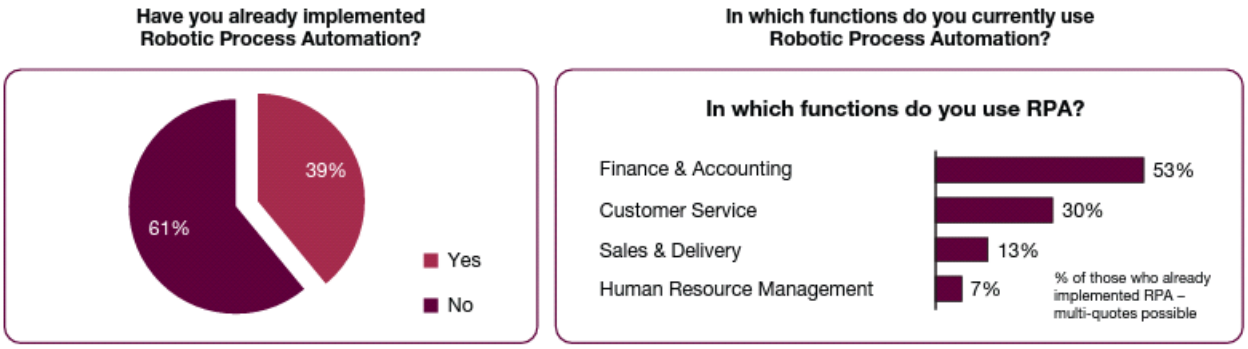
As RPA becomes more common, companies will begin to implement knowledge-based automation, enabling robotic automation to work with many more exceptions. A typical example of knowledge-based automation would be in Customer Service functions, searching for information across systems and answering customer emails. Finally, while RPA has not developed into the all-cognitive periphery, experts definitely see potential for RPA to eventually be able to think for itself, working along-side humans on value-adding initiatives that are important to the bottom line of the firm.

Source: A report from Capgemini Consulting

Robotic Process Automation is not only advantageous for employees, but also for companies. Tasks can be completed quickly, accurately, and at a lower cost through the implementation of robotic automation solutions. Statistics indicate that robots make fewer mistakes and work significantly faster than humans— a software robot can cost as little as 1/3rd of the price of an offshore full-time employee (FTE) and as little as 1/5th of the price of an onshore FTE. This results in anywhere between 20%-50% cost savings. Moreover, automation reduces human involvement, therefore reducing human error by up to 20%. Additional robots can start working in a mere 20 minutes to help relieve backlog if needed.

Actual use of Robotic Automation

Companies of all sizes already use or intend to implement robotics within the next 3 - 5 years. Regardless of the individual implementation approach, RPA is a major digital transformation for companies and it is picking up momentum.



Source: A report from Capgemini Consulting

Even though Robotic Process Automation is currently used in nearly all outsourcing companies, others just started this kind of process optimization. Moreover, the initiatives are independent of the size of the company, defined by revenues in Euros earned per annum.

Robotic Process Automation at Capgemini

Capgemini Consulting and Capgemini Business Services have joined forces to investigate the current understanding of RPA, what perceived advantages it offers, current sourcing and automation strategies, as well as the future outlook and implementation plans for Robotic Process Automation within back office processes.

To ensure the accuracy and applicability of trends identified in Robotic Process Automation, Capgemini Consulting and Capgemini Business Services created and distributed a survey which investigated the following topics:

- General thoughts towards RPA;
- Implementation statuses in various functions;
- Sourcing structures;
- Standardization of processes;
- Future plans with regard to sourcing and RPA.

The scope of the study concentrated on back office processes, i.e. Finance & Accounting (F&A), Human Resource Management (HR), Customer Services, Procurement & Warehousing, Sales & Distribution and Production Planning.

Three benefits of RPA bring to Corporate functions:-

1. **Improved Employee and Customer satisfaction**

   • Tedious repetitive tasks are delegated to robots.

   • Time generated to focus on customer care.

   • Empowered employees to perform more value-added tasks.

2. **Accelerated productivity gains**

    • 1 Robot replaces on average 4 FTEs.

    • Robot costs on average 50% - 90% lower than off-shore / on-shore employee.

    • Quick development cycles, provides ROI in 3-6 months.

3. **Enhanced compliance**

    • Traceability reduces risk of errors and secures consistency.

    • Automated Control steps increase compliance.

    • Systematic documentation of audit trail.

Applications of RPA in gaining highest efficiency:-

HR Services

Due to the huge amount of repetitive, often manual, administrative tasks, under the shape of form fillings, data capturing, updating and disseminating and large number of request processing, HR is a gold mine of opportunities for automation

▪ Data Entry, Payroll, Joiners, Movers, Leavers, Time & attendance Management, Benefits Administration, Recruitment (back office), Compliance and Reporting, Personnel Administration.

Supply Chain

Supply chain problems cost companies between 9-20% of their value over a period of 6 months. Below processes are typically prone to automation and represent typical area of improvement in any supply chain operations.

▪ Inventory management, Demand and supply planning, Invoice and contract management, Work order management, Returns processing, Freight management.

Finance and Accounting

F&A is another area where automation can have significant positive impact on cost savings, improved efficiency and streamline processes, when applied

▪ Procure to Pay (AP), Order to Cash, Record to Report, Vendor Management, Collections, Incentive Claims, Sales Order.

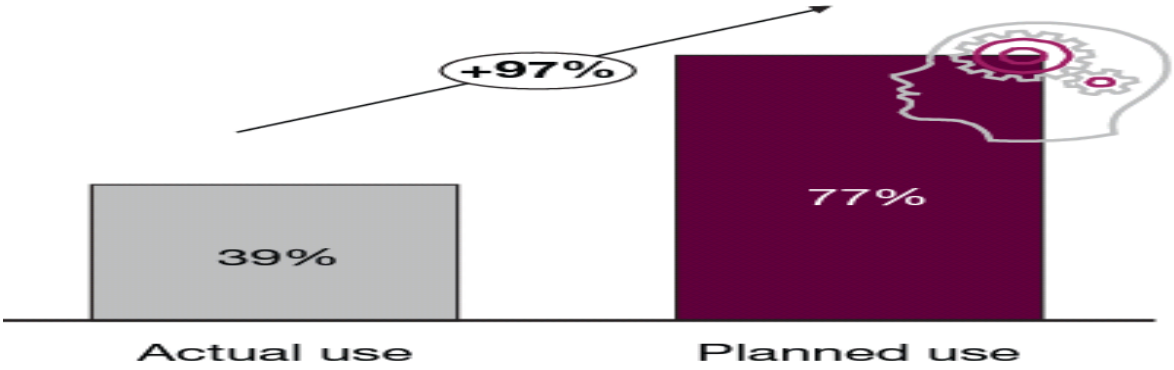
IT Services

With an estimated 30% of time spent on low level tasks, IT is compelled to embrace automation as a way to focus on the initiatives that require innovative thinking, and be able to tackle with the critical organizational tasks currently consuming much of their time.

▪ Software deployment, Server and app monitoring, Routine maintenance & monitoring, Email processing and distribution, Batch Processing, Password reset/unlock, Back up & restoration.

Expected increase in RPA usage within the next 3 - 5 years

Although only 39% of companies are currently using robotic solutions, 77% are planning to implement RPA within the next 3 - 5 years.



Source: A report from Capgemini Consulting

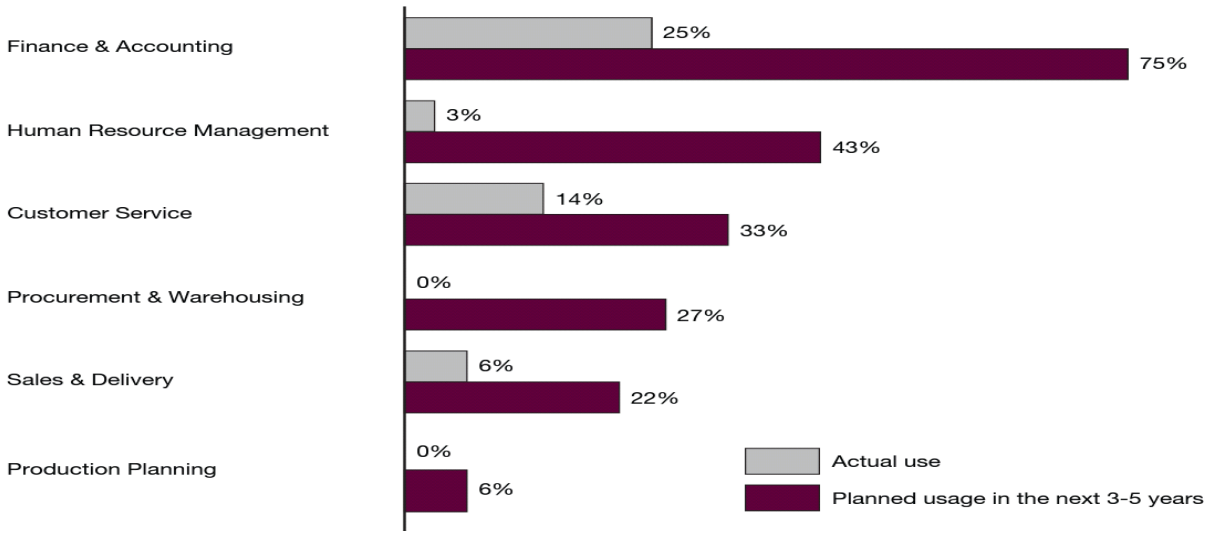
When analyzing where companies plan to implement RPA in the next 3 - 5 years, it becomes clear that all back office functions will be affected. Finance & Accounting currently seem to be the pacemakers, followed by Human Resource Management and Customer Service. These three functions are the well-known targets for Shared Services and Outsourcing decisions since their wide-spread introduction in the 1990s.

Capgemini Consulting fosters successful RPA implementations based on three scenarios

Implementation Scenarios	Description	Advantages
1 Tool Focused RPA Implementation	*The client buys just a licence for an RPA tool. The provider can be used as technical support but the rest of the implementation is led by the client*	▪ Implementation is conducted with **light external support**
2 Assisted RPA Implementation	*A management consultancy partners with a software provider to be able to deliver a smooth RPA implementation and transition from both business and IT side*	▪ **Organisational transition and knowledge transfer** is ensured ▪ **Success of the first implementation** phase is secured during project mode
3 Factory Service	*The client procures a RPA solution as a service (Captive, Outsourcing) and the service provider handles everything else*	▪ **Capabilities** to develop, adjust and maintain robots is **not required** ▪ Client **focuses on business value added**

Source: A report from Capgemini Consulting

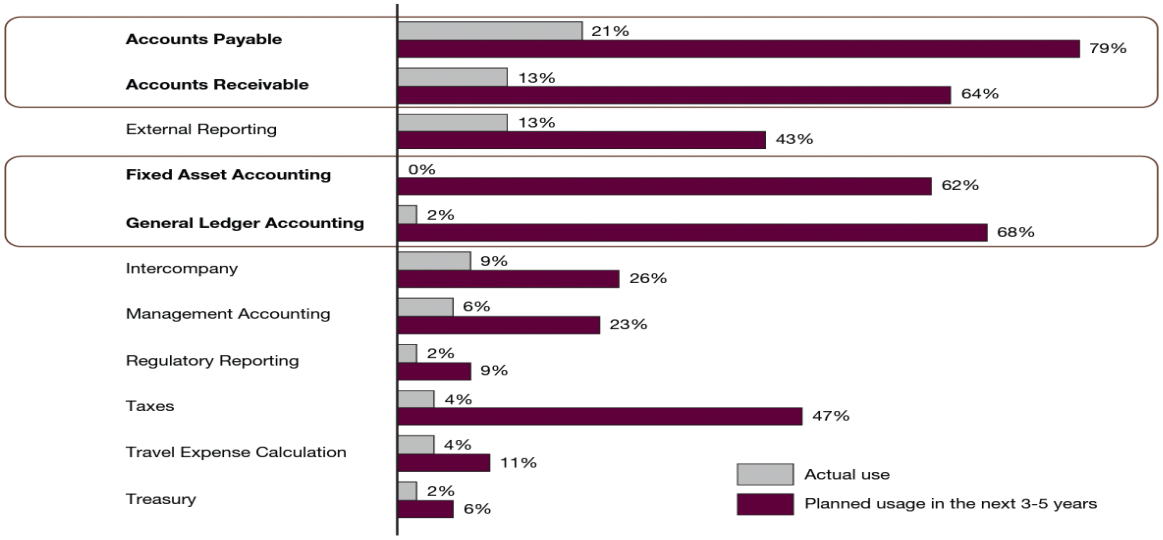
Process areas - where companies plan to use RPA



Source: A report from Capgemini Consulting

Multiple systems seem to be current interested to implement the RPA. In particular, Cost Centre reallocation of staff and departments, application for leave and workforce planning, payroll administration, salary garnishment and assignment as well as collection of performance appraisal and bonus calculation are mentioned by HR executives.

RPA plans for Finance & Accounting



Source: A report from Capgemini Consulting

The significant percentage of people that plan to implement RPA clearly indicates that companies recognize the considerable advantages that RPA can provide. However, the processes and tasks that are selected highly dependent on company specifics, such as the current setup of process as well as the system and application environment. An in depth investigation into the objectives and measures of success for a RPA implementation is highly recommended in order to ensure that the decisions are based on the business case.

Conclusion:-

RPA has possible application in a number of industries; the potential to cut out monotonous tasks across a wide variety of roles, functions, and departments and a relatively unobtrusive technical implementation with a shallow learning curve for those in the organization who rely on it. When this happens the finance function will be recognized as the nerve center of the enterprise, enabling the entire organization to reimagine its own future.

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BIGDATA ENACTMENT OF APRIORI ALGORITHM FOR HANDLING VOLUMINOUS DATA

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ABSTRACT

Apriori is one in all the key algorithms to return up with frequent item sets. Analyzing frequent item set may well be an important step in analyzing structured info and realize association relationship between things. This stands as degree elementary foundation to supervised learning, that encompasses classifier and have extraction strategies. Applying this formula is crucial to grasp the behavior of structured information in scientific domain area unit voluminous. process such reasonably information needs state of the art computing machines. putting in place such associate degree infrastructure is pricey. therefore a distributed surroundings such as a clustered setup is used for grappling such eventualities. Apache Hadoop distribution is one in all the cluster frameworks in distributed surroundings that helps by distributing voluminous information across a number of nodes within the framework. This paper focuses on map/reduce style and implementation of Apriori formula for structured information analysis.

KEYWORDS

Frequent Item set, Distributed Computing, Hadoop, Apriori, Distributed data processing

I. INTRODUCTION

In several applications of the $64000 world, generated information is of nice concern to the neutral because it delivers purposeful info / information that assists in creating prophetical analysis. This knowledge helps in modifying sure call parameters of the applying that changes the overall outcome of a business method. the quantity of information, put together referred to as data-sets, generated by the applying is incredibly massive. So, there's a requirement of process massive data-sets efficiently. The data-set collected could also be from heterogeneous sources and will be structured or unstructured information. process such information generates helpful patterns from that information will be extracted. the best approach is to use this example and insert headings and text into it as appropriate. Data mining is that the method of finding correlations or patterns among fields in massive data-sets and building up the knowledge-base, supported the given constraints. the goal of information mining is to extract information from associate degree existing data-set and rework it into a human-understandable structure for any use. This method is usually brought up as information Discovery in data-sets (KDD). the method has revolutionized the approach of finding the complicated real-world problems. KDD method consists of series of tasks like choice, pre-processing, transformation, data mining and interpretation as shown in Figure1.

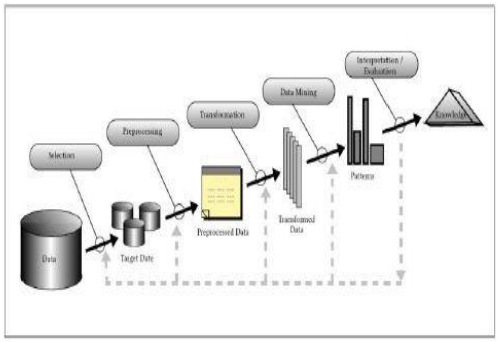

Figure 1: KDD Process

In a distributed computing surroundings may be a bunch of loosely coupled process nodes connected by network. every nodes contributes to the execution or distribution / replication of knowledge. it's brought up as a cluster of nodes. There area unit varied strategies of setting up a cluster, one amongst that is sometimes brought up as cluster framework. Such frameworks enforce the putting in process and replication nodes for knowledge the opposite strategies involve putting in of cluster nodes on ad-hoc basis and not being sure by a rigid framework. Such strategies simply involve a group of API calls

essentially for remote technique invocation (RMI) as a locality of inter-process communication. The method of putting in a cluster depends upon the info densities and au fait the scenarios listed below:

• the info is generated at varied locations and desires to be accessed domestically most of the time for process.

• the info and process is distributed to the machines within the cluster to reduce the impact of any specific machine being over laden that damages its process

This paper is organized as follows, future section can discuss regarding complete survey of the connected work disbursed the domain of the distributed data processing, specially centered on finding frequent item sets. The section three of this paper discusses about the planning and implementation of the Apriori algorithmic program tuned to the distributed environment, keeping a key concentrate on the experimental test-bed demand. The section 4, discusses regarding the results of the check setup supported Map/Reduce – Hadoop. Finally conclude our work with the section five.

II. STYLE AND IMPLEMENTATION

The experimental setup has 3 nodes connected to managed switch joined to non-public LAN. one in all these nodes is organized as Hadoop Master or because the name node that controls the info distribution over the Hadoop cluster. All the nodes square measure identical in terms of the system configuration i.e., all the nodes have identical processor – Intel Core2 couple and assembled by normal manufacturer. As investigatory effort, configuration created to grasp Hadoop can have 3 nodes in absolutely distributed mode. The intention is to scale the amount of nodes by victimization normal cluster management software package which will simply add new nodes to Hadoop instead of installing Hadoop in each node. The visual image of this setup is shown within the figure two.

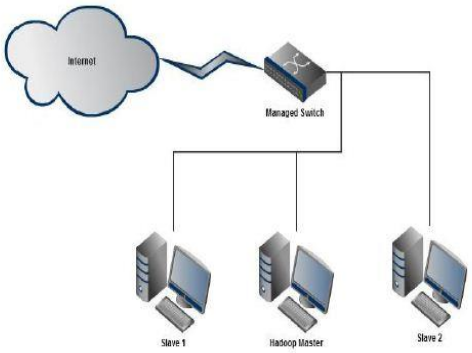

Figure 2: Experimental Setup for Hadoop Multi-node

III. SYSTEM READYING

The overall readying of the desired system is unreal victimisation the system organization as represented within the figure three. Series of Map calls is created to send the info to cluster node and also the format is of the shape <Key, Value> then a scale back calls is applied to summarize the resultant from totally different nodes. an easy user interface is adequate to display these results to user in operation the Hadoop Master

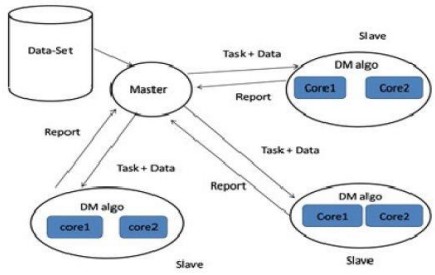

Figure 3: System Organization

IV. ALGORITHM

The formula mentioned produces all the subsets that will be generated from the given Item set. any these subsets ar searched against the data-sets and therefore the frequency is noted. There are scores of information things and their subsets, thence they have to be searched them at the same time in order that search time reduces. Hence, the Map-Reduce concept of the Hadoop design comes into image. Map operate is forked for each subset of the things. These maps will run on any node within the distributed setting configured below Hadoop configuration. the task distribution is taken care by the Hadoop system and therefore the files, data-sets needed ar place into HDFS. In every Map function, the worth is that the item set. the full of the data-set is scanned to search out the entry of the worth item set and therefore the frequency is noted. this is often given as associate degree output to the scale back function within the scale back category outlined within the Hadoop core package.

V. RESULTS

The experimental setup delineated before has been rigorous tested against a Pseudo-distributed configuration of Hadoop and with standalone computer for variable intensity of knowledge and group action. The totally organized multi-node

Hadoop with differential system configuration (FHDSC) would take relatively very long time to method information as against the totally organized similar multi-nodes (FHSSC)). Similarity is in terms of the system configuration ranging from laptop design to package running in it. this can be clearly pictured within the figure four.

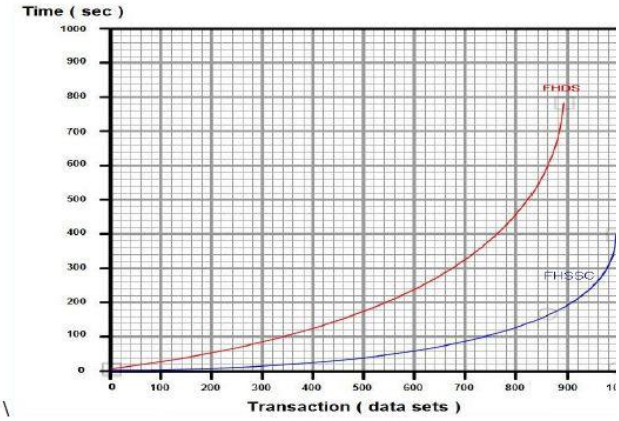

Figure 4:FHDSC Vs. FHSSC

The results for taken from the 3-node Fully-distributed and Pseudo distributed modes of Hadoop for large transaction are fairly good till it reaches the maximum threshold capacity of nodes. The result is depicted in the figure 5.

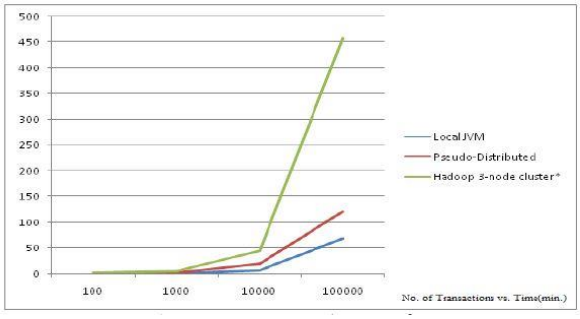

Figure 5:Transactions VsHadoop Configuration

Looking the graph, there is large variance in time seen at threshold of 12,000 transactions.
Beyond which the time is in exponential. This is because of the computer architecture and limited storage capacity of 80GB per Node. Hence the superset transaction generation will take longer time to compute and the miner for frequent item-set. Where N is the number of nodes installed in the cluster.

VI. CONCLUSIONS

This paper presents a completely unique approach of new algorithms for clustered setting. This is applicable to eventualities once there data-intensive computation is needed. Such setup provides a broad avenue for investigation and analysis in data processing. trying the demand for such algorithm there's pressing ought to focus and explore a lot of regarding clustered setting specially for this domain.

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A Study and survey on effect of junk food in the health of adolescent girls

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Abstract:

Junk refer to fast food which are easy to make and easy to consume. The purpose of current study was to explore the perceptions of health effects of frequent junk food consumption in adolescent stage. Adolescence is a transitional period between childhood and adulthood, which begins from the earliest signs of secondary sexual characteristics development and ends when a person has achieved adult status. Late adolescence (17-21 years of age) is characterized by increased independence and experimentation. A sample size of 119 member's population in a specific community was taken. Self-administered questionnaire prepared by the investigator with 20 closed ended questions open ended questions was selected as the tool for the required study. Eliminating the temptation for junk food and developing the awareness for fitness can be helping in avoid the junk food from the healthy diet regimen.

Key words: Junk Food, Health, Consumption, Survey, obesity

Introduction:

Adolescence is the only time following infancy when the rate of physical growth actually increases. This sudden growth spurt is associated with hormonal, cognitive, and emotional changes that make adolescence an especially vulnerable period of life. First, there is a greater demand for calories and nutrients due to the dramatic increase in physical growth and development over a relatively short period of time. Poor nutrition during any of these stages can have lasting consequences on an adolescent's cognitive development, resulting in decreased learning ability, poor concentration, and impaired school performance Eating junk food has become a trend. The children hate homemade healthy food. Junk food is injurious to health. Eating Burger and Pizza increases cholesterol in human body. The fat in human body increases. The increase fat is dangerous for heart. Drinking soft drinks adds dangerous toxins in human body. It affects the bone, skin and kidney. These foods and their can affect digestive system, its effects can emerge after many years. Studies have found that food colouring can cause hyper activity and lapses of concentration in teenagers. These are the foods which have low or no calories. They have ingredients which are unhealthy for our regular diet which include large amounts of fats and salts. Some of the foods like French fries, fried foods, pizza, burgers, candy, soft drinks, baked goods, ice cream, cookies, etc are the example of high-sugar and high-fat containing foods. Junk foods are the source of constipation and other disease like diabetes, heart ailments, clogged arteries, heart attack, strokes, etc because of being poor in nutrition. The consumption of junk food all over the world is increasing day by day which is not good for the future. People of all age groups like to eat junk food and they generally chose to eat whenever they enjoy special time with family like birthday party, marriage anniversary, etc. They easily become used to of taking soft drinks, wafers, chips, noodles, burgers, pizza, French fries, Chinese dishes, and other varieties of junk food available in the market. It reduces level of concentration and calls to chronic diseases such as obesity, hormonal imbalances, heart diseases, high blood pressure, diabetes etc.

Materials & Methods:

The study was a descriptive study using survey method with a sample size of 119.
Data was collected using structured questionnaire from college in Hyderabad selected by convenient random sampling method. The target populations identified were teenagers between the age group 17 years to 21 years studying in colleges. Socio demographic variables were analyzed using descriptive statistics and association between variables was elucidated.

Results:

Survey has taken on girls in different age groups, 87% belonged to the age group of 17– 21 and 13% belongs to 19-21.A total of 119 people living in urban areas were selected for this survey. Study subjects were assessed using a questionnaire format including information for how frequently people take up junk food, which type of junk food, effects of junk foods etc.

Table showing Frequency of junk food and aerated drink consumption per week

(Target study for 100)

S.No.	Parameter	Frequency	No.of.Teenagers(119)
1	Junk food consumption per week according to survey conducted	Never	34
		Some times (1-5)	41
		More than 5-6 times/week	31
		Regularly	13
2	Aerated Carbonated drinks / per week approx	Never	23
		Some times (1-5)	42
		More than 5-6 times/week	31
		Regularly	23

Health consequences for intake of junk food:

Consuming junk food leads to severe health problems in adolescent age specifically in girls. The major consequences include-

- **Abnormal Weight gain (Obesity):**

Increased in body weight **is** one of the most common effects of consuming junk foods are increased obesity. It's composition of loads of Carbohydrates, calories and fats contribute to weight-gain. Obesity can cause many medical issues like diabetes, joint-pain and heart diseases.

- **Type-II Diabetes**
  Dense sugar content can cause dental cavities and Type - II diabetes. The high levels of sugar in junk food which puts metabolism under stress at adolescent stage .This is due to the secretion of high amounts of insulin by pancreas.
- **Heart diseases**
  High content of Trans fat in commercially available fast foods predispose children to risk of future heart diseases. Fast food intake leads to higher proportion of calories being derived from total and saturated

fat .moreover, the micronutrient content of the Junk food &Aerated carbonated drinks is also low levels of calcium and magnesium in the taken measure to liberalize the international trade to reduce the cost of food grains

- **Effects Appetite and Digestion**

  Consumption of excess junk food leaves the brain in a complex condition. Excessive sugar intake can cause blood sugar level to fluctuate and makes the brain demand more food, which eventually leads to overeating. It makes it difficult for the body to digest excessive junk food.

- **Effect on the reproductive system in early adolescence:**

  The ingredients in junk food and fast food may have an impact on your fertility. One study found that processed food contains phthalates. Phthalates are chemicals that can interrupt how hormones act in your body. Exposure to high levels of these chemicals could lead to reproductive issues, including birth defects.

Discussion & conclusion:

Taking of Junk food is a dietary habit of our present day teenagers. Consumption of diet reach in sugar, saturated fat, salt and calorie can lead to early development of health hazards. There are various reasons for consumption of such food by adolescent girls. Most of fast food users know well about negative effects associated with junk food consumption. However, they take junk food without considering their health complications. The young generations are getting addicted to have this type of foods which leads to a serious public health problem. Identifying the magnitude of the junk food prevalence and factors promoting its consumption is a primary step towards planning multipronged strategies to address this growing health hazard thus protecting our teenagers from the long term ill effects of junk foods.

Acknowledgement:

We, the authors of the present paper truly acknowledge the girls co-operated and participated in the survey also for sharing their views towards the Junk food consumption in daily life.

AN OBSERVATIONAL STUDY ON CAUSATIVE FACTORS SEEN IN PATIENTS UNDERGOING CORONARY ARTERY BYPASS GRAFTING (CABG)

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Abstract **Aim:** to study the effect of life style changes and diet as causative factors among patients undergoing coronary artery bypass grafting.

Objectives: to assess the prevalence of cabg, to explore the association of lifestyle and dietary factors among patients undergoing cabg.

Results: among 60 subjects the detailed study identified the common risk factors with respect to coronary artery bypass grafting. the studies showed a higher percentage of risk for cabg in age group of 41-60 years and is mostly prevalent in males. majority of patient are with normal bmi and non-smokers.

hypertension and diabetes are superiorly predominant and dietary patterns recorded are favorably non vegetarians.

Conclusion: from the result it is very clear that majority of patients studied with cabg belongs to age group 41-60 years and is mostly seen in males. majority of them are accompanied with co-morbidities like hypertension, obesity and diabetic. and predominantly follows a non- vegetarian diet**.**

key words: Cardiovascular diseases, Coronary Artery Bypass Grafting, Hypertension, Obesity, Diabetes, Diet.

I. INTRODUCTION

CARDIOVASCULAR DISEASES (CVDS) ARE A GROUP OF DISORDERS OF THE HEART AND BLOOD VESSELS. . CARDIOVASCULAR DISEASES ARE THE LEADING CAUSE OF DISEASE BURDEN AND DEATHS GLOBALLY. (1) AND THEY INCLUDE:

- Coronary heart disease – disease of the blood vessels supplying the heart muscle;
- Cerebrovascular disease – disease of the blood vessels supplying the brain;
- Peripheral arterial disease – disease of blood vessels supplying the arms and legs;
- Rheumatic heart disease – damage to the heart muscle and heart valves from rheumatic fever, caused by streptococcal bacteria;
- Congenital heart disease – malformations of heart structure existing at birth;
- Deep vein thrombosis and pulmonary embolism – blood clots in the leg veins, which can dislodge and move to the heart and lungs.

Important causes of cardiovascular disease include atherosclerosis, when fatty deposits accumulate in the arteries.

Atherosclerosis is also the most common cause of cardiovascular disease. It can be caused by correctable problems, such as an unhealthy diet, lack of exercise, being overweight and smoking. Damage to the circulatory system can also result from diabetes and as the result of other health conditions, such as a virus, an infection, or a structural problem that the person was born with. It often involves high blood pressure, but this can be both a cause and a result of cardiovascular disease.

Coronary Artery By-pass Grafting

Coronary Artery Bypass Graft surgery (CABG) is a surgical procedure that is used to treat coronary artery disease (CAD). In CAD, a waxy substance called plaque builds up inside the blood vessels (coronary arteries) that are responsible for supplying oxygen and nutrients to the heart muscles. This leads to narrowing of the coronary arteries. During the procedure, the doctor surgically connects a healthy blood vessel from your leg, arm or chest to the heart and creates a new pathway around the blocked or the partially blocked artery to restore blood flow.

Percutaneous Transluminal Coronary Angioplasty (PTCA)

Percutaneous transluminal coronary angioplasty (PTCA) also called percutaneous coronary intervention (PCI) is a minimally invasive procedure to open blocked or stenosed coronary arteries allowing unobstructed blood flow to the myocardium.

The present study aims at conducting an observational study to know the causative factors of patients undergoing CABG

OBJECTIVES:

- To assess the prevalence of CABG and its associated risk factors among adult population belonging to age group 21-60 years.
- To explore the association of the following factors with CABG
  Diet – high fat intake, low fiber intake
  Hypertension
  Obesity
  Smoking
  Physical inactivity
- To bring awareness among people regarding the lifestyle modifications
- To educate them regarding the dietary modifications to be followed , so as to reduce the risk factors leading to CABG

Population and Sample

The sample population (n = 60) was randomly chosen from a Multi speciality Hospital of Secunderabad. All the patients were of different age groups of 21-80, sex, socio- economic status, ethnicity with different co-morbidities. A pre tested format consisting of Patient profile, subjective data, objective data, bio-chemical data, medications and 24hour dietary recall followed by Medical Nutrition Therapy during the hospital stay.

I. RESEARCH METHODOLOGY

The study was taken up by 3 students of P.G Diploma In Nutrition and Dietetics on the patients who were posted for CABG in a Multi speciality hospital, to know the causative risk factors during the tenure of 3 months. Subjects were analysed for the presence of co-morbidities and dietary factors .Hypertension, Obesity, Diabetes Mellitus , Hypothyroidism and combination of these were analysed.

PARTICIPANTS:

The sample population (n = 60) was randomly chosen from a Multi speciality Hospital of Secunderabad. All the patients were of different age groups of 21-80, sex, socio- economic status, ethnicity with different co-morbidities.

MATERIALS AND METHOD:

A structured questionnaire was designed for undertaking the study to know the parameters such as –Patient profile, chief complaints, diagnosis, present illness, history of past illness, cardio-vascular surgery the patient underwent, subjective data , objective data, biochemical data, medication given, 24-hour dietary recall, diet on discharge of individual were followed and analyzed.

The entire data was recorded and analyzed in detail. The attributes dealt in depth were –Gender, age group, BMI ranges, biochemical parameters, types of medications given, type of diet to know the consumption of fiber and fat, diet on discharge, their percentages and number were calculated for the compilation of the data .

The most common symptoms analyzed in the compilation of study are- chest pain, shortness of breath, decreased appetite, weakness , pain , etc.

STUDY SUBJECTS: Patients posted for CABG

STUDY DURATION: The study was conducted over a period of 3 months.

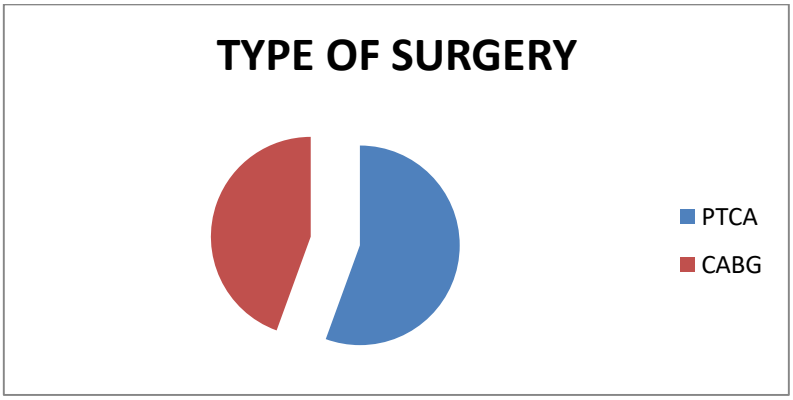
OBSERVATION: From the study it was observed that patients who underwent CABG, were having abnormal biochemical parameters, and their 24-hour recall showed that their diet was low in fiber, more in fats and simple carbohydrates.

STATISTICAL ANALYSIS: The data of present study was analyzed using percentages and is represented through pie charts and bar diagrams.

IV. RESULTS AND DISCUSSION

CARDIOVASCULAR SURGERIES PERFORMED :

TYPE OF SURGERY	NUMBER	PERCENTAGE
Minor (PTCA)	60	50%
Major (CABG)	60	50%



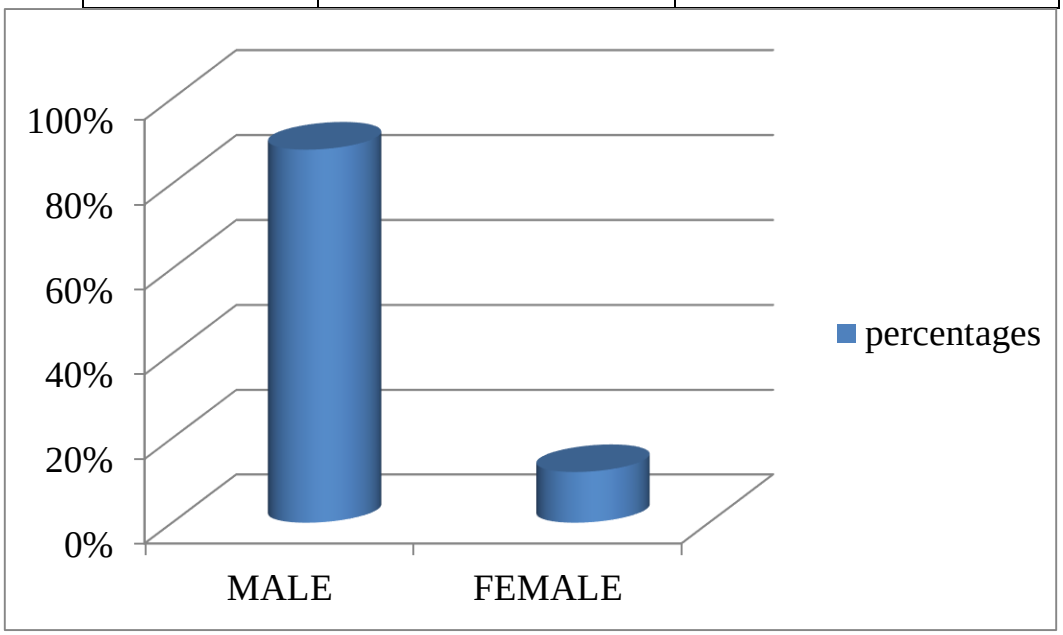
The above diagram represents the percentages of surgeries i.e., 60% minor and 40% major surgeries.

GENDER CLASSIFICATION

The total number of patients assessed was 60 of which male and female patients were present. The table below gives the gist.

GENDER PROFILE:

GENDER	SURGERY Number	Percentage
MALE	53	88%
FEMALE	7	12%

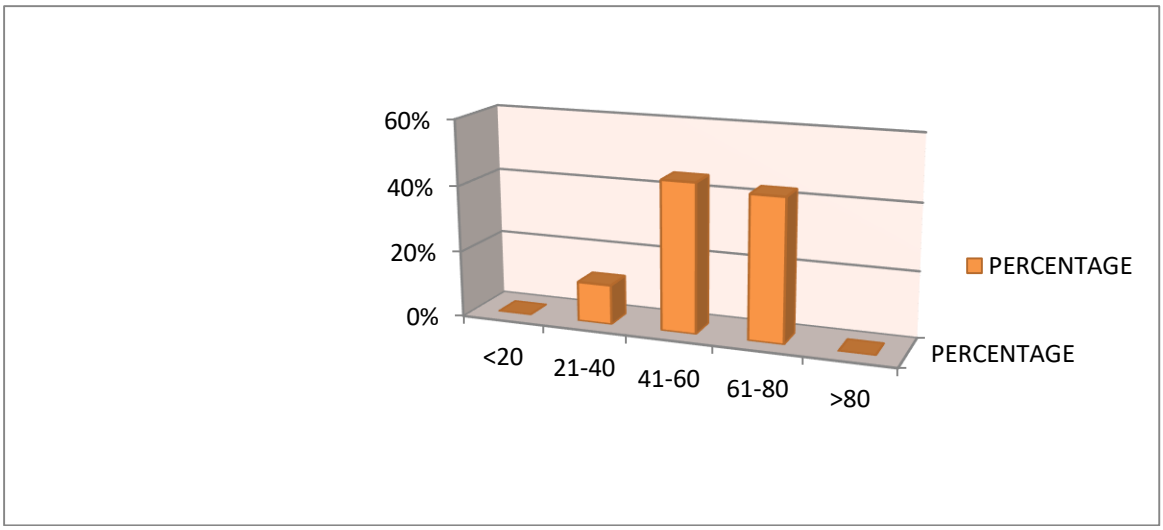


The above bar graph represents that the majority of the patients assessed with major surgery profile were males (88%) and females (12%) respectively.

AGE CLASSIFICATION

The age distribution of the patients is shown below :

AGE	NUMBER	PERCENTAGE
<20	-	-
21-40	7	12%
41-60	27	45%
61-80	26	43%
>80	-	-

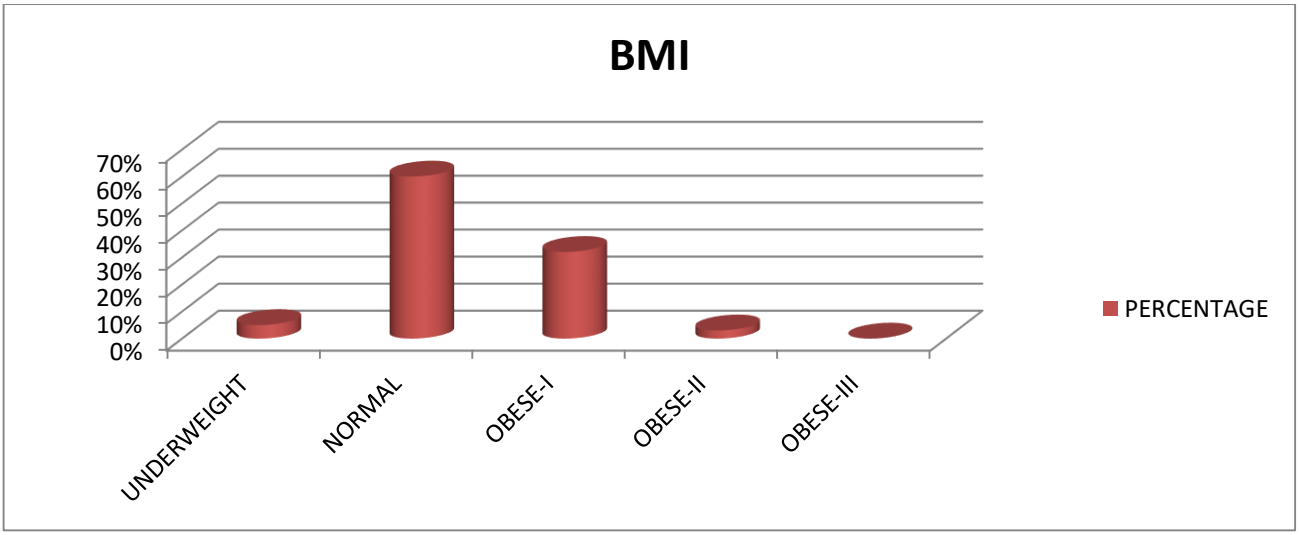


From the above representation, it is observed that CABG surgeries performed are estimated highest i.e.. 45% in the group of 41-60 years , 43% in the group of 61-80 years followed by 12% in the age group 21-40 years .

BMI PROFILE:

The patients were assessed as per BMI and classified according to their nutritional status.

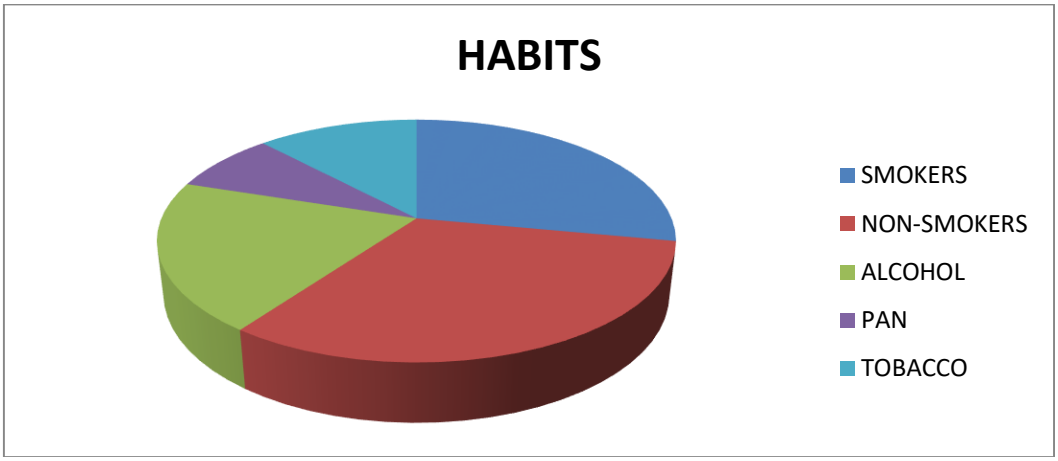
RANGES	NUMBER	PERCENTAGE
UNDERWEIGHT(<18.5)	3	5%
NORMAL(18.5-24.9)	36	60%
OBESE GRADE- I (25-29.9)	19	32%
OBESE GRADE –II(30-39.9)	2	3%
OBESE GRADE-III(>40)	0	-



The graph represents the percentage of BMI of the subjects; of which 5% are underweight, 60% are normal, 32% are obese grade-1, 3% are obese grade-2 and 0% are obese grade-3

SOCIAL HABITS:

SOCIAL HABIT	NUMBER	PERCENTAGE
SMOKERS	17	28%
NON-SMOKERS	19	32%
ALCOHOL	12	20%
PAN(BETTLE LEAVES)	5	8%
TOBACCO	7	12%

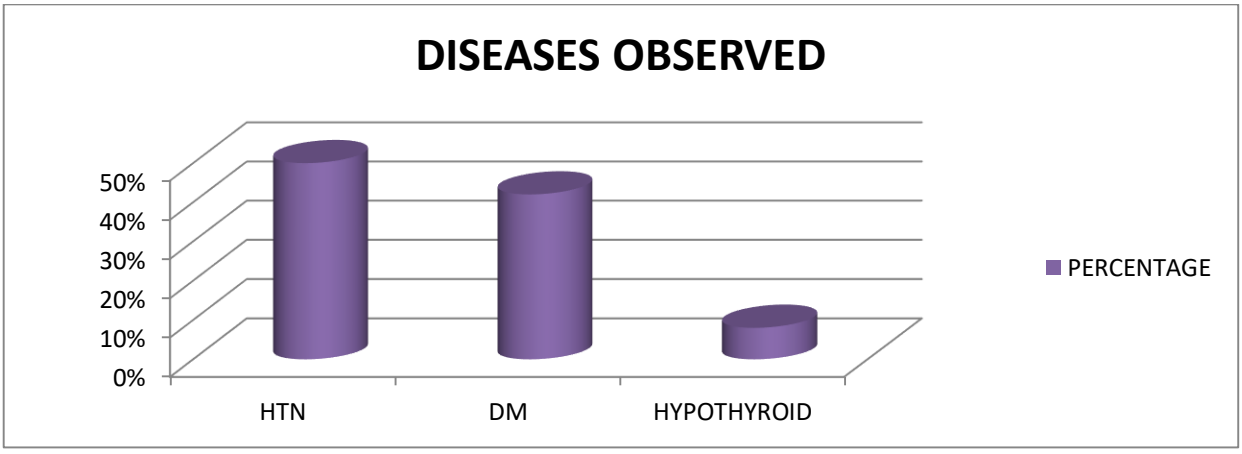


The above pie chart represents the percentage of social habits of the subjects, out of which 28% are smokers, 32% are non-smokers, 20% are alcoholic, 8% are pan eaters and 12% are tobacco chewers.

VARIOUS DISEASE CONDITION OBSERVED IN PATIENTS:

The patients were admitted due to various metabolic diseases such as Hypertension, Diabetes, Hypothyroidism, etc..

DIAGNOSIS	NUMBER	PERCENTAGE
Hypertension	30	50%
Diabetes Mellitus	25	42%
Hypothyroidism	5	8%



From the estimated data collected of all the patients, 50% were hypertensive, 42% were diabetic and 8% were hypothyroid.

SUBJECTIVE DATA:

The subjective data of the patients were evaluated as shown in the table.

SUBJECTIVE DATA	**STATUS**	**NUMBER**	**PERCENTAGE**
Appetite	Normal	50	83%
	Polyphagia	-	-
	Decreased	10	17%
Hunger	Normal	54	90%
	Sub-optimal	5	8%
	Starvation	1	2%
Thirst	Normal	55	92%
	Polydypsia	5	8%
	Decreased	-	-

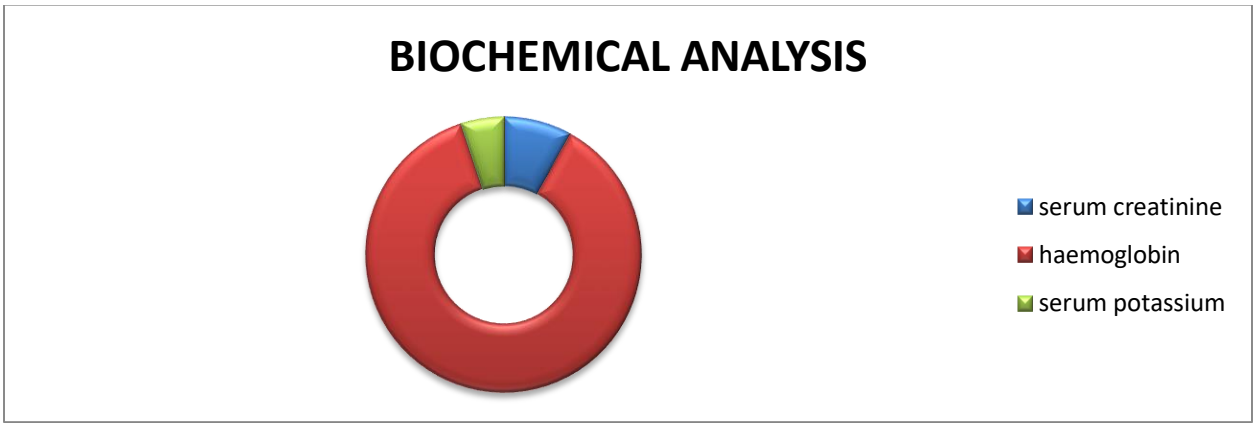
Bowel	Normal	55	92%
	Constipated	5	8%
	Diarrhea	-	-
Micturation	Normal	58	97%
	Polyuria	2	3%
	Oliguria	-	-
Sleep	Good	58	97%
	Unrefreshing	2	3%

Most of the patients suffering from cardiovascular disease have normal appetite, only few are assessed with decreased appetite. About 42% were diabetic among which 8% complained of polydypsia, 3% was complaining of polyuria, and 97% were having normal micturation. 92% had normal GI function except for few. And also 97% was having good and refreshing sleep whereas 3% were having unrefreshing and disturbed sleep.

BIOCHEMICAL PARAMETERS

The biochemical data of the patients were evaluated and interpreted. The details are shown in the table.

ABNORMAL BIOCHEMICAL PARAMETERS	NUMBER (n=60)	PERCENTAGE
↑ Serum creatinine	5	8%
↓ Haemoglobin	52	87%
↓ Serum potassium	3	5%



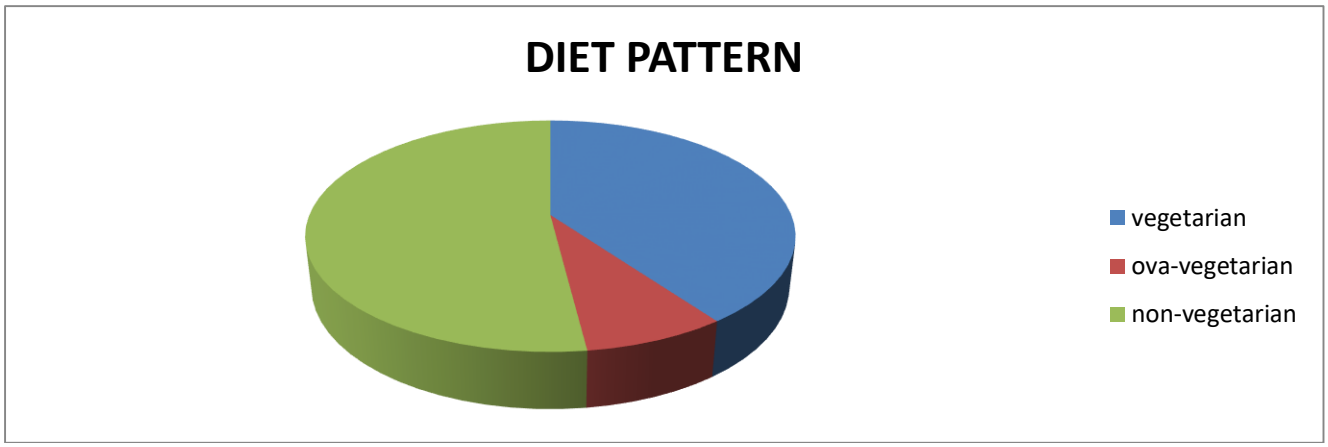
From the analysed data ,8% of the subjects were having increased serum creatinine levels, 87% of them were having low haemoglobin levels, and 5% of them were having low serum potassium levels.

DIET PATTERN :

On assessing the patients they were grouped under following type of diet pattern.

TYPES OF DIET PATTERN

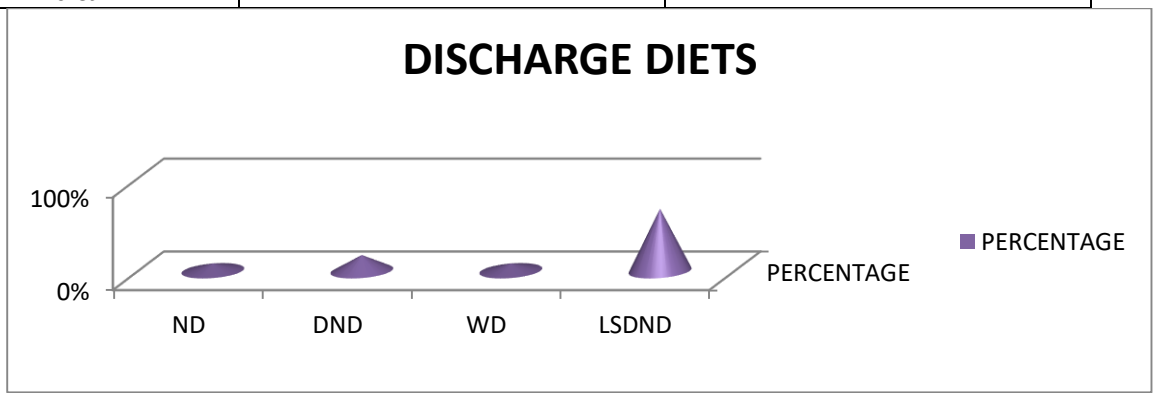
Types of diet	Number	Percentage
Vegetarian	24	40%
Ova-vegetarian	5	8%
Non-vegetarian	31	52%



Among all the subjects assessed, majority of them are non-vegetarians i.e.., 52%, followed by vegetarians i.e.., 40% and the rest i.e...8% are ova-vegetarians.

TYPES OF DIET ADVISED ON DISCHARGE:

TYPES OF DIET	NUMBER	PERCENTAGE
Normal diet	5	8%
Diabetic normal diet	10	17%
Warfarin diet	5	8%
Low salt diabetic normal diet	40	67%



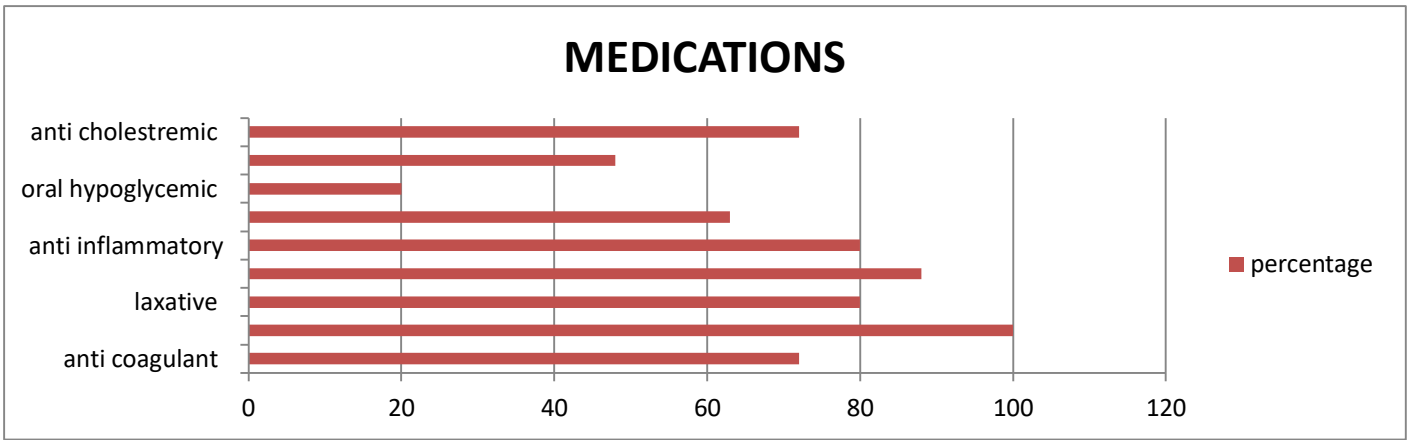
According to the data collected, 8% were advised normal diet, 17%-diabetic normal diet 8 % - warfarin diet, 67% low salt diabetic normal diet.

Warfarin diet is prescribed for patients who are on acitrom tablet which is a blood thinner. The diet restricts vitamin K rich foods. Majority of the subjects were advised low salt diabetic normal diet.

MEDICATIONS:

The various types of drugs prescribed to the patients are as follows:

CLASS OF DRUGS	NUMBER	PERCENTAGE
Anti coagulant drugs	43	72
Antacid drugs	60	100
Laxative drugs	48	80
Pain killer drugs	53	88
Anti inflammatory drugs	48	80
Anti cholestremic drugs	43	72
Anti hypertensive drugs	38	63
Oral hypoglycemic drugs	12	20
Vitamin and mineral supplements	29	48



According to the study, of all the subjects 100% were given Antacid drugs , 88% were given painkillers , 80% were given Anti-inflammatory drugs and laxative drugs , 72% were given Anti-coagulant and Anticholestremic drugs , 63% were given Anti-hypertensive drugs , 48% were given Vitamin and Mineral supplements and 20% were given oral hypoglycemic drugs .

II. ACKNOWLEDGMENT

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THE ROLE OF NUTRITION IN CHEMOTHERAPY IN CHILDREN WITH ACUTE LYMPHOBLASTIC LEUKAEMIA

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ABSTRACT: Nutrition is an important part of cancer treatment. Eating the right kinds of foods during and after treatment can help the patient feel better and stay stronger. Malnutrition isone of the major problems in children with cancer. Severe weight loss and abnormally low concentrations of certain plasma proteins such as albumin and transferrin have been recognized for a long time in patients with cancer, including children. An observational study was conducted among 50 children affected with ALL undergoing chemotherapy at oncology department of 3 multispeciality hospitals of Hyderabad.

AIM & OBJECTIVE: The aim of this study is to determine the Role of nutrition in children with Acute Lymphoblastic Leukemia undergoing Chemotherapy and to study the effect of chemotherapy on biochemical parameters of patient with acute lymphoblastic leukemia.

METHODOLOGY:

An observational study was conducted among 50 children between the ages 01-12 years diagnosed with ALL (Acute lymphoblastic leukemia) undergoing treatment at oncology dept. of 3 multispecialty hospital in Hyderabad. Various factors such as Age, socio economic status, diet preference, Weight changes during chemotherapy, side effects of chemotherapy, Dietary pattern, Biochemical parameters before and after chemotherapy were studied for which a structured case study format was used.

RESULTS:

From this study it was concluded that 70% of the children were malnourished upon receiving chemotherapy there was weight gain in 30% of them and 20% had lost weight. Also there was a significant effect of chemotherapy on the biochemical parameters of children. It was seen that there was a decrease in the WBC level in 64% of them and also decrease in HB level in 44% of the children. It was also observed that the children who ate well showed considerable amount of weight gain and improvement in the biochemical parameters. Hence nutrition does play an important role in treatment of children with ALL

Key words: Acute Lymphoblastic Leukemia, children, nutrition, malnutriton

INTRODUCTION:

Acute lymphoblastic leukemia (ALL) is a type of cancer that affects the blood and bone marrow. ALL is characterized by an overproduction of immature white blood cells, called lymphoblast or leukemic blasts. Because the bone marrow is unable to make adequate numbers of red blood cells, normal white cells and platelets. People with ALL become more susceptible to anemia, recurrent infections, and to bruising and bleeding easily. The blast cells can then spill out of the bone marrow into the bloodstream and accumulate in various organs including the lymph nodes (glands), spleen, liver and central nervous system (brain and spinal cord).(1)

Causes of ALL (Acute lymphoblastic leukemia): The exact causes of ALL remain largely unknown but it is thought to result from mutations in one or more of the genes that normally control blood cell development. This mutation will result in abnormal growth.

Research is going on all the time into possible causes of this damage, and certain factors have been identified that may put some people at an increased risk. These include exposure to very high doses of radiation either accidentally (nuclear accident) or therapeutically (to treat other cancers)

Industrial chemicals like benzene, pesticides, and certain types of chemotherapy used to treat other cancers. Certain types of viral infections and the way in which the immune system reacts may play a role in the development of some types of ALL. People with certain genetic disorders like Down's syndrome and Fanconi's anemia may have a higher than average risk of developing ALL.(2)

ALL (Acute lymphoblastic leukemia) is the most common type of cancer in children.

In a healthy child, the bone marrow makes blood stem cells (immature cells) that become mature blood cells over time. A blood stem cell may become a myeloid stem cell or a lymphoid stem cell.(3)

MATERIAL & METHOD:An observational study was conducted among 50 children between the ages 10-12 years diagnosed with ALL (Acute lymphoblastic leukemia) undergoing treatment at oncology dept. of 3 multispecialty hospitals in Hyderabad.

An institutional case study format was designed to record the anthropometric measurements and also the biochemical parameters like Haemoglobin, Red blood cells, White blood cells, Platelets level before and after chemotherapy. Dietary pattern and preferences were also studied. Changes in weight were and their acceptance towards food was recorded.

RESULTS AND DISCUSSION:.People with ALL[Acute Lymphoblastic Leukemia] become more susceptible to anaemia, recurrent infections and bleeding easily.

The current study found that there was 60% of boys and 40% of girls.Upon the analysis of data among 50 children 70% of the children were malnourished. The malnutrition is having much impact on ALL[Acute Lymphoblastic leukemia] in developing countries. The major nutrition indicators are weight for age and serum albumin.

There was weight gain in 30% of them and 20% had lost weight. Among 50 children 36% of them were of middle class and 64% of them were of low income group which inturn effect the nutritional status. The side effect of chemotherapy on children there was 24% of children was effected with fever and 24% of patient with vomiting and 52% of patient did not show any side effect. Since specific antioxidants have shown to be depleted as a consequence of therapy.

Also there was a significant effect of chemotherapy on the biochemical parameters of children. Haemoglobin levels may have a better prognosis than predicted by the WBC[white blood cell] count. It was seen that there was a decrease in WBC level in 64% and also decrease in HB level in 44% of the children respectively.

Hence these are some Dietary Guideline

1. Children whose Biochemical parameters are affected by Chemotherapy should consume a Balanced Diet.

2. A diet rich in Iron should be consumed.

3. Avoid fast foods.

4. Maintain meal timings.

5. it's preferable to eat small meals at frequent intervals to enhance absorption and digestion.

6. To maintain weight, a Balanced Diet with Good quality Proteins, Folic acid, Vitamin B12 and Vitamin-C should be taken.

7. Chicken, fish weekly twice and 3 egg whites per day is recommended. Green leafy vegetables which are good source of Folic acid should be included.

8. Do not combined an Iron rich meal with too many Calcium rich foods. Take it an hour before or after the meal

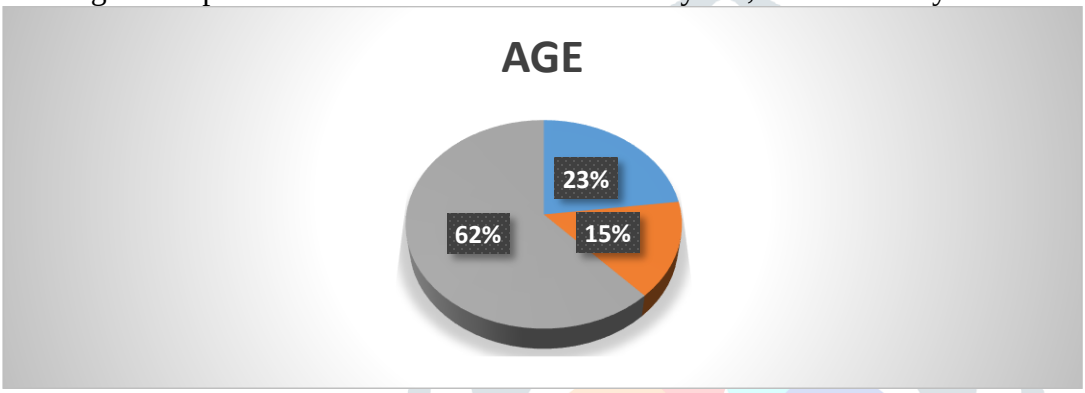
9. Eat Vitamin-C- rich food at the same time that when iron rich food is consumed.

10. Avoid tea and coffee with meals.

RESULTS:

1) Age

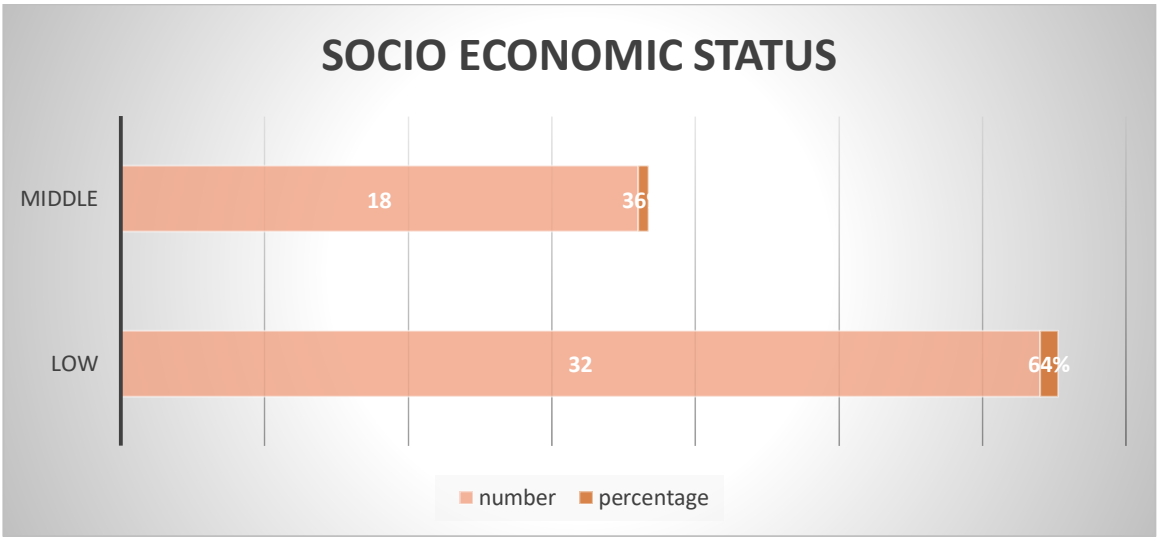
Among the 50 patients 52% of children were of 1-5 years, 34% of 6-10 years and 14% were of 10-20 years.



2) Socio Economic status

Upon analysis of data among 50 children, 36% of them were of middle class and 64% of them were of low income group.

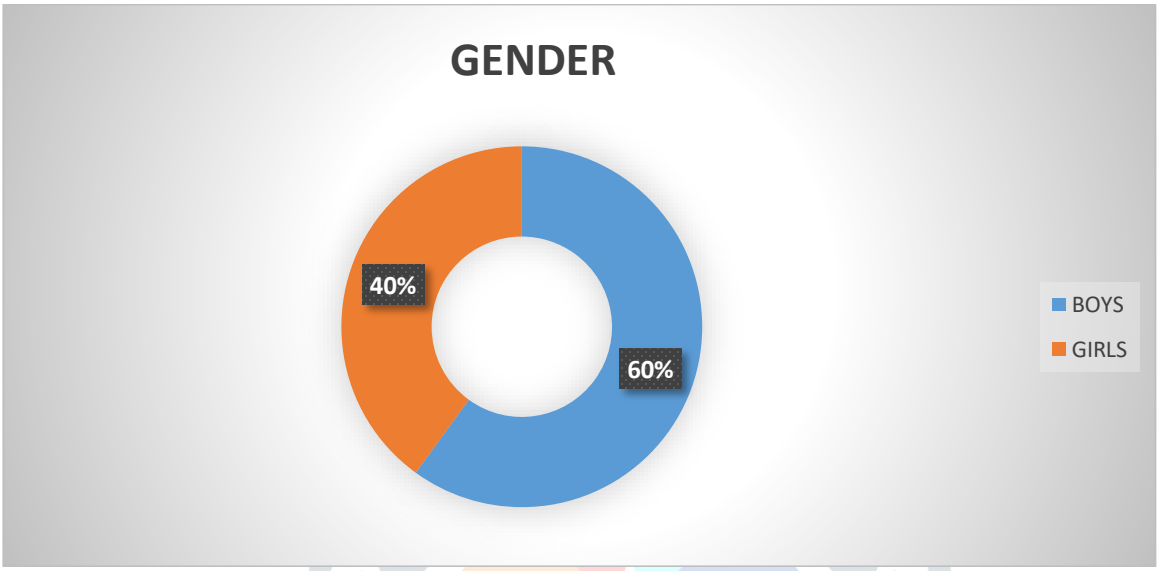
Status	Number (no=50)	Percentage
Low	32	64%
Middle	18	36%



3) Gender:

Among the 50 patients were 30 boys and 20 girls.

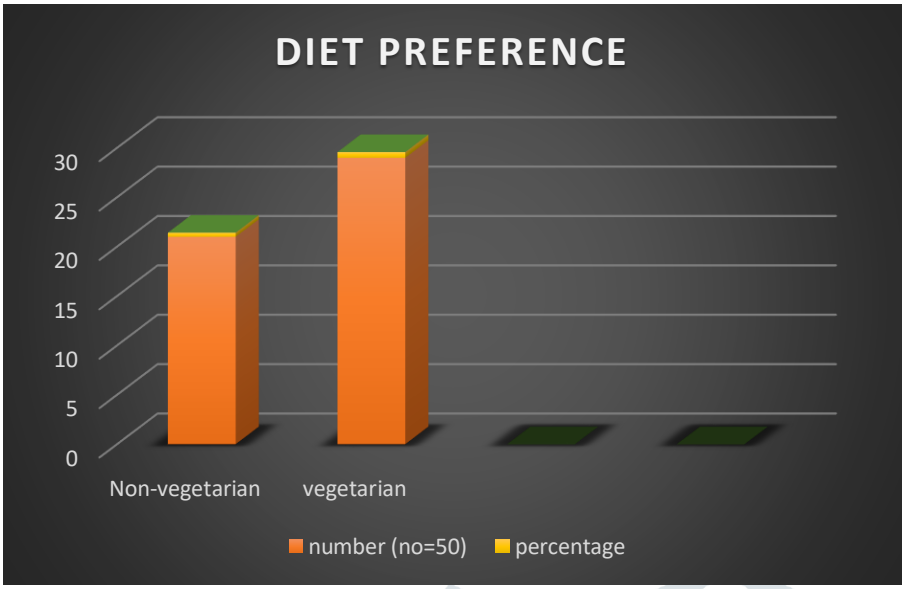
GENDER	NUMBER (no=50)	PERCENTAGE
BOYS	30	60%
GIRLS	20	40%



4) Diet preference

Children were grouped into two groups based on their preference of diet. It was seen that 42%% of children were non- vegetarian and 58% of children were vegetarian.

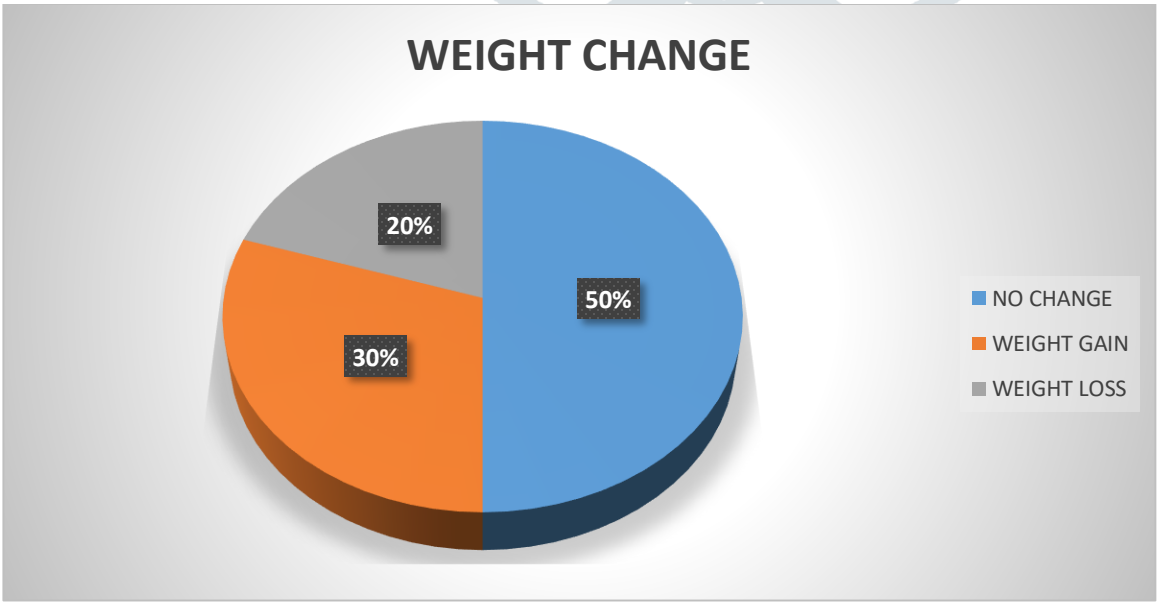
Diet preference	**Number (no=50)**	**Percentage**
Non-vegetarian	21	42%
Vegetarian	29	58%



5) Weight Changes during chemotherapy

Upon analysis of data, it was seen that 50% of them had no weight changes, 30% of them gained weight and 20% of them lost weight during chemotherapy.

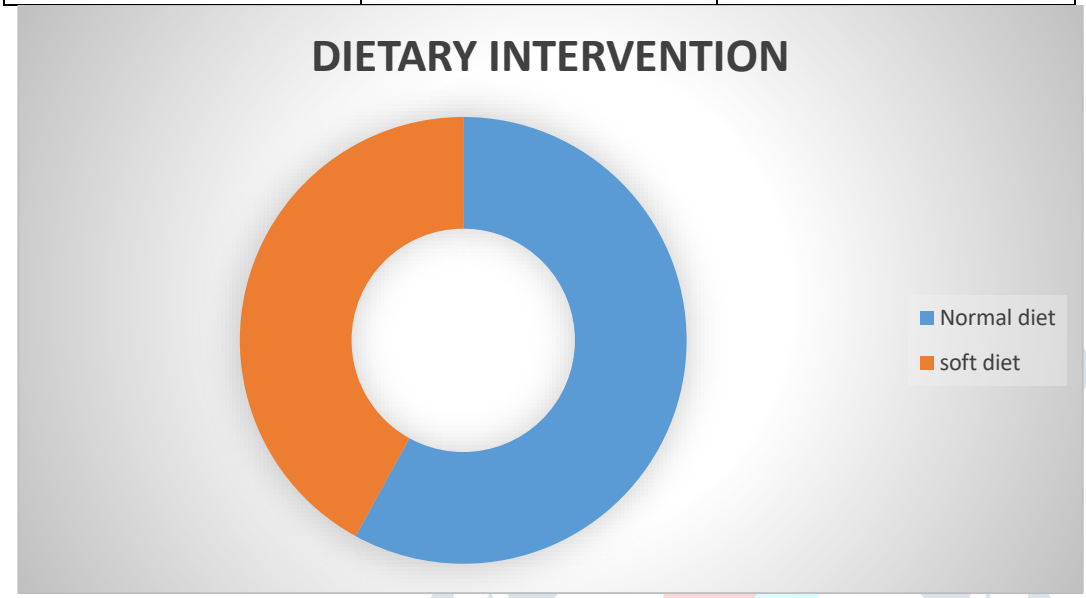
Weight change during chemotherapy	Number (no=50)	Percentage
No weight change	25	50%
weight Gain	15	30%
weight Loss	10	20%



6) Dietary intervention

Upon analysis of data, it was seen that among 50 respondents 58% were on normal diet and 42% were on soft diet.

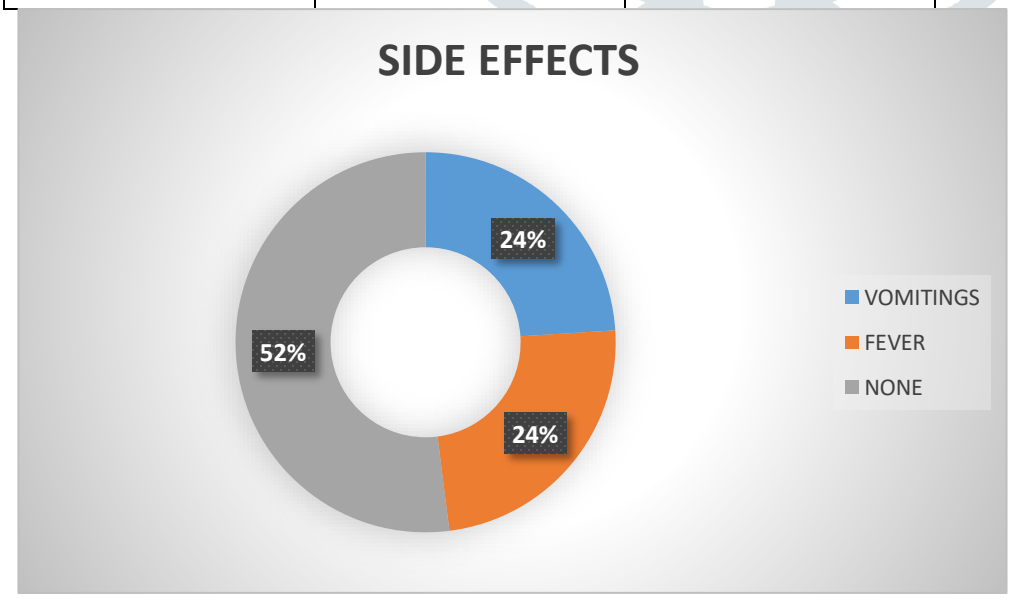
Diet	Number (no=50)	Percentage
Normal diet	**29**	**58%**
Soft diet	**21**	**42%**



7) Side Effects

The table below illustrates that 24% had vomiting's, 24% had fever and 52% did not show any side effect.

Side effect	Number (no=50)	Percentage
Vomiting's	12	24%
Fever	12	24%
None	26	52%

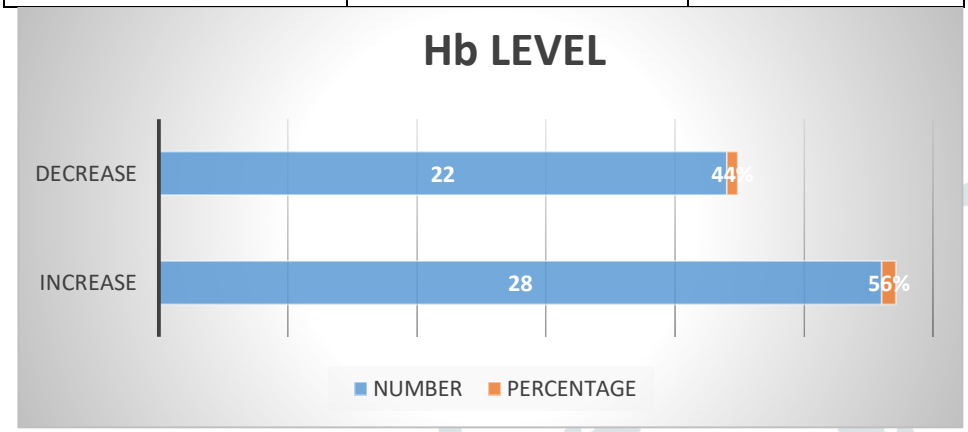


BIOCHEMICAL PARAMETERS

8) HAEMOGLOBIN LEVEL

56% of the children showed increase in the Haemoglobin levels after chemotherapy and 44% showed decrease in haemoglobin level.

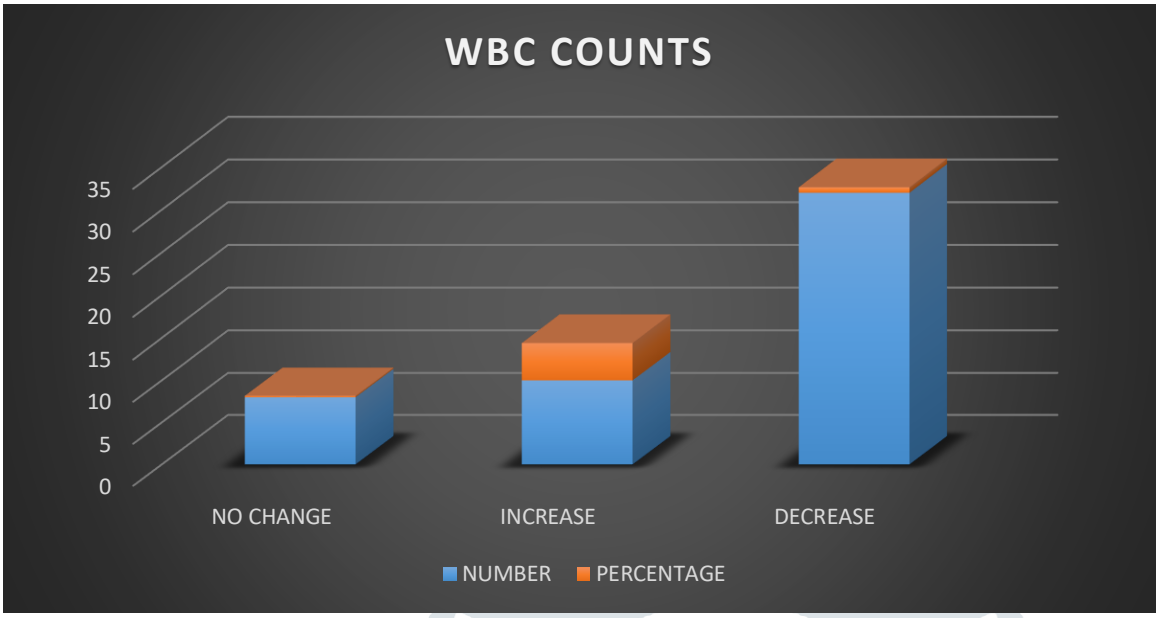
Hb level	Number (no=50)	Percentage
Increase	28	56%
Decrease	22	44%



9) WBC Level

There was no change in WBC count in 16% of them,whereas 20% of them had increased WBC count and in 64% of them the WBC countdecreased during chemotherapy.

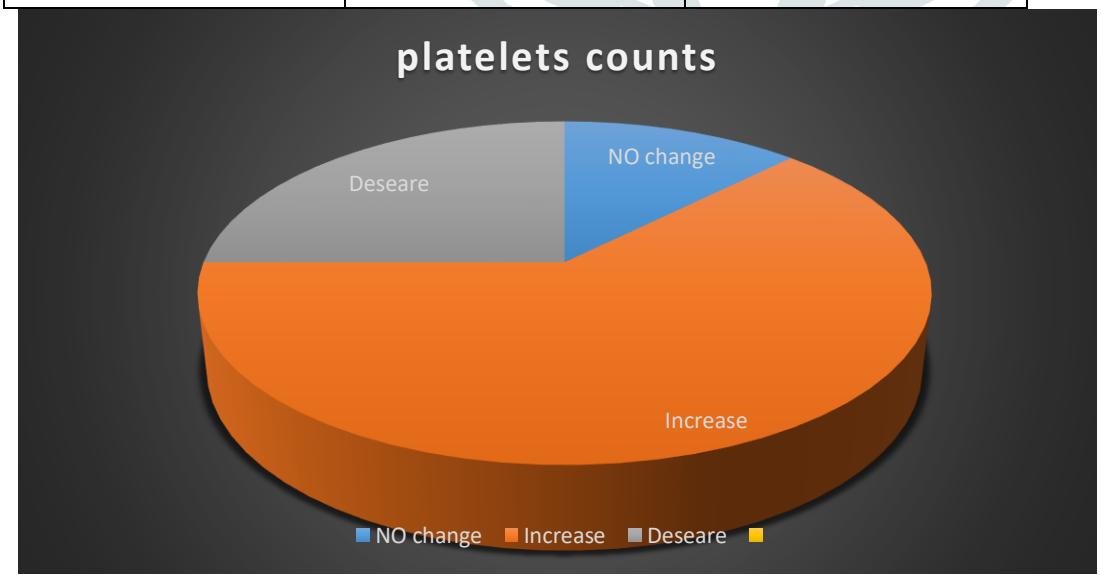
WBC LEVEL	Number (no=50)	Percentage
No change	8	16%
Increase	10	20%
Decrease	32	64%



8) Platelets count

It was seen that 10% of them had no change in platelet count, in 50% of them the platelets level increased and in 20% the platelets level decreased.

Platelets counts	Number (no=50)	Percentage
No change	5	10%
Increase	25	50%
Decrease	10	20%



CONCLUSION

Acute Lymphoblastic Leukemia [ALL] is a type of cancer that affects the blood and bone marrow because the bone marrow is unable to make adequate numbersof red blood cells , normal white cells and platelets. From this study we can conclude that 70% of the children were malnourished upon receiving chemotherapy. The effect of chemotherapy of patient with Acute Lymphoblastic Leukemia. Malnutrition is having much impact on prognosis of ALL[Acute Lymphobastic Leukemia] in developing countries. The dietary intake data at the time of cancerdiagnosis is a multicenter setting in pediatric population at high risk for nutrition related morbidity. Like Anemia is the most frequently observed haemotological abnormalities faced by cancer patients. Children survival of ALL[Acute Lymphoblastic Leukemia] in developing countries could improve if problems that are associated with parental financial and medical teams attitude to treatment and follow up could be addressed better.

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Food Sanitation and Hygiene Practices among Food Handlers in Food Joints in Hyderabad

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ABSTRACT

AIM: The aims and objective of the present study was to know the level of awareness of the food handlers regarding food sanitation and hygiene while handling food. To observe and study the sanitation and hygiene practices followed by the food handlers of the food joint.

OBJECTIVE: Diseases spread through food still remain a common and persistent problems resulting in appreciable morbidity and occasional mortality. Food handlers play an important role in ensuring food safety throughout the chain of production, processing, storage and preparation. (1)

In large scale cooking, food is handled by many individuals, which increases the chances of food contamination due to improper handling and service. Intentional or accidental contamination of food during large scale production might endanger the health of consumers, and have very expensive repercussions on the public. The purpose of this study was to evaluate the food safety knowledge, and sanitation practices among institutional food- handlers in Hyderabad.

MATERIALS AND METHODS: The survey was administered orally, and responses were recorded on questionnaires by the handlers. The survey included 35 questions that had information on restaurant and food handler demographics, food safety knowledge, behaviors, and personal hygiene. The knowledge questions were in true-false, multiple-choice, and open-ended format. The primary subject areas in this study included appropriate temperatures for cooking, heating, and cooling foods, cross contamination, and behavioral questions such as working while ill and hand hygiene practices.

RESULT: We learn that most of the food service establishments in Hyderabad are aware of the basic hygiene practices. They are very particular about the personal hygiene of the staff and sanitation of the food being prepared. They take proper care of the ingredients and are concerned about their hygiene. Majority of the personnel have not undergone a food safety training program but wanted to be a part of it.

CONCLUSION: The study suggests that even though the knowledge, attitude and practice level of the food handlers was satisfactory, some of the aspects related to hygiene and time and temperature control need to be stressed. Continuous education and training should be organized to strengthen food handlers' knowledge in areas which seem to be lacking.

Keywords: *teacher, professional development, education, Mongolia*

INTRODUCTION AND REVIEW OF LITERATURE

The rapidly growing and changing food demands by urban dwellers has resulted in the need for cheaper and convenience foods. Food poisoning and other food borne diseases could occur through poor hygiene practices, especially in areas where food and drinks are served.

It is of good concern that World Health Organization (WHO, 2007) reported in the year 2005 that 1.8 million people died from diarrhea one of vary food borne diseases. For this reason, food borne diseases have captured public awareness worldwide in recent years. Centre Disease (3) Control and Prevention (CDC, 2000) identified five risk factors of food handling that add to food borne illnesses which include improper cooking procedure, temperature abuse during storage, lack of hygiene and sanitation by food handlers, cross contamination between raw and fresh ready to-eat foods.

In large scale cooking, food is handled by many individuals which increase the chances of food contamination due to

improper handling and service. Intentional or accidental contamination of food during large scale production might endanger the health of consumers, and have very expensive repercussions on the public. The purpose of this study was to evaluate the food safety knowledge, attitudes, and practices among institutional food- handlers in Hyderabad.

Food-borne disease is attributed to a wide variety of bacteria, parasites and viruses. It is worldwide and cause human illness just about everywhere (Scott and Sockett, 1998; Tauxe, 1998; WHO, 1998). (2)

Food poisoning occurs as a result of consuming food contaminated with microorganisms, the contamination arising from inadequate storage methods, unhygienic food handling, cross-contamination from food contact surfaces, or from persons with poor hygiene.

Unhygienic practices during food preparation, handling and storage create the condition that allows the transmission of disease causing organisms such as bacteria, viruses and other food-borne microorganisms. Additionally, increased food borne illnesses have been attributed to careless food hygiene practices in big kitchens.(4)

The Food Safety and Standards Authority of India (FSSAI) is the governing body under the ministry of health and family welfare, Govt of India. It has been established under Food Safety and Standards , 2006 which consolidates various acts & orders that have hitherto handled food related issues in various Ministries and Departments. FSSAI has been created for laying down science based standards for articles of food and to regulate their manufacture, storage, distribution, sale and import to ensure availability of safe and wholesome food for human consumption.

To provide assurance of food safety, Food businesses must implement an effective Food Safety Management System (FSMS) based on Hazard Analysis and Critical Control Point (HACCP) and suitable pre- requisite programmes by actively controlling hazards throughout the food chain starting from food production till final consumption.

Hence a need was felt to assess the knowledge and practices regarding food sanitation and hygiene among food handlers of food joints were felt and hence this survey was planned and executed.(8)

90 students of B.sc Final year studying Applied Nutrition and Public health at department of Nutrition in St. Ann's college for Women conducted a survey on food sanitation and hygiene practices among food handlers in fast food joints across Hyderabad during the months of August-October 2018. A total of 110 persons aged 25 and above were interviewed.

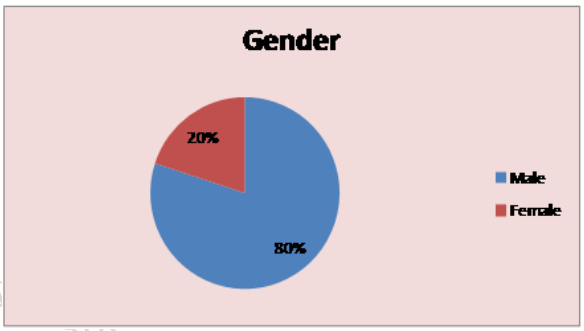
MATERIALS AND METHODS

The study was conducted using a descriptive, structured questionnaire in 25 restaurants by conducting face to face interview of food-handlers. The questionnaire was used to elicit information to collect information on (i) age, education qualification, , (ii) knowledge on food safety, (iii) attitudes towards food safety and (v) sanitation and hygiene practices. Some aspects of the study also comprised of observations made by the interviewer.Face-to-face interviews were conducted using structured questionnaire to collect information on the knowledge, attitudes and practices of the food-handlers on food sanitation and hygiene practices.

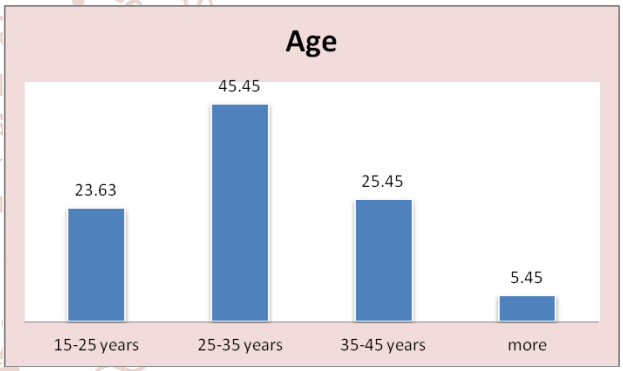
The questionnaire consisted of questions with food sanitation knowledge comprising close-ended questions with three possible answers; "true", "false", and "do not know". These questions specifically dealt with respondents' knowledge of personal hygiene, cross contamination, food-borne diseases, microorganisms, temperature control and hygienic practices.

In section five, which dealt with food hygiene practices, the good hygienic practices of respondents (institutional food-handlers) were assessed and evaluated based on self-reporting of personal hygiene and other safe food handling practices.

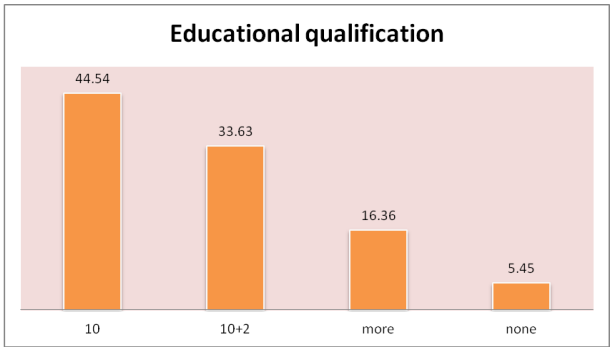
RESULTS



1. The survey was conducted in 110 food handlers of which 80% people questioned were men and 20% were women.

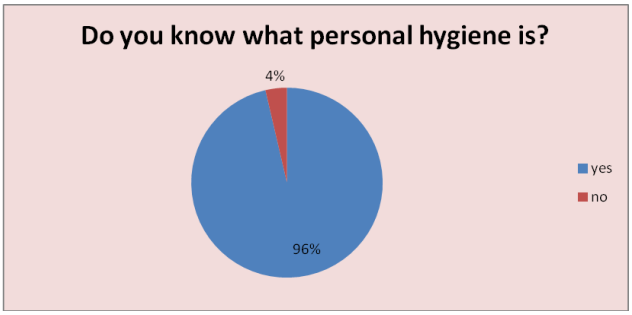


2. 45.45% participants were in the age group of 25-35 years, 25.45% and 23.63% people were between 35-45 years and 15-25 years of age. While only 5.45% of the participants were above 35 years of age

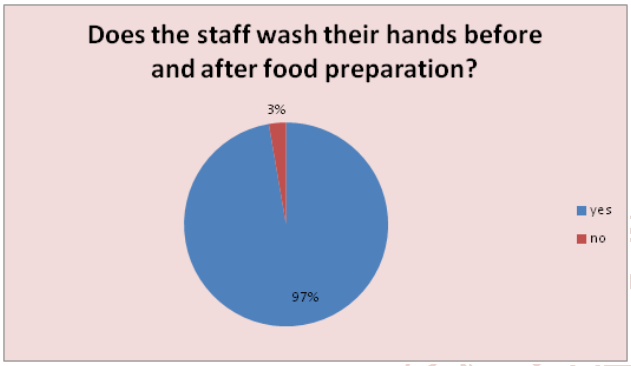


3. 44.54% participants were 10th passed and around 33.63% people had studied intermediate. About 16.36% participants were graduates and some have done a diploma course in hotel management. There were only 5.45% people who had no education qualification.

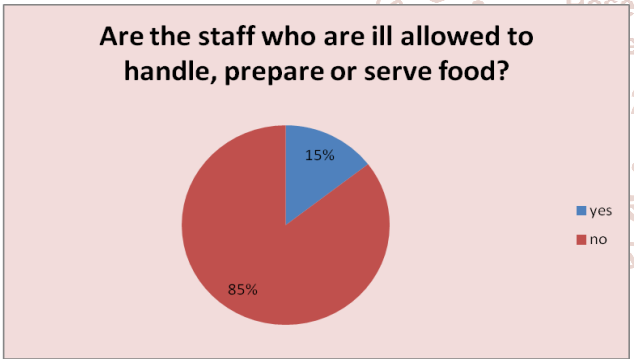
4. Most of the people questioned were food handlers and serving waiters. Few chefs and staff members were also questioned.



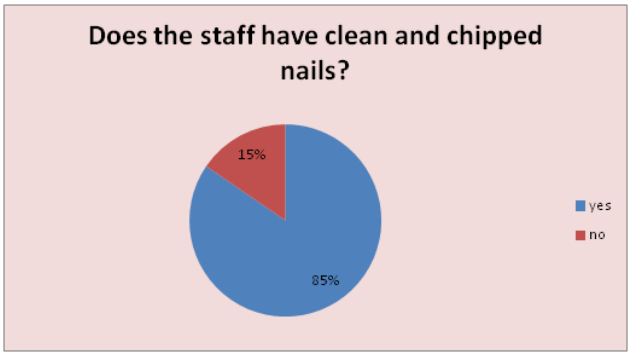
About 96.36% of the participants know about personal hygiene through food safety training they received. There were only 3.63% people who were unaware of what personal hygiene is.



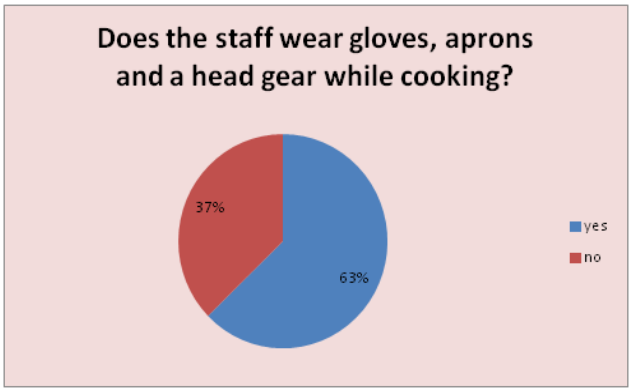
5. Most of the people about 97.27% wash their hands thoroughly before and after preparation of food. Only 2.63% people don't practice hand washing



6. In 85.45% of outlets, the staff member is not allowed to handle, prepare or serve food when he is ill. 14.54% places allow their staff to work even when ill.

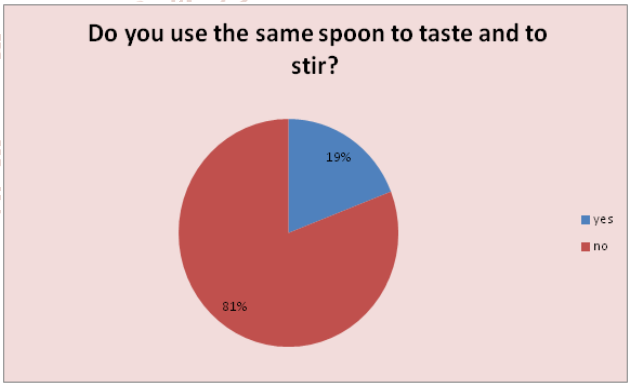


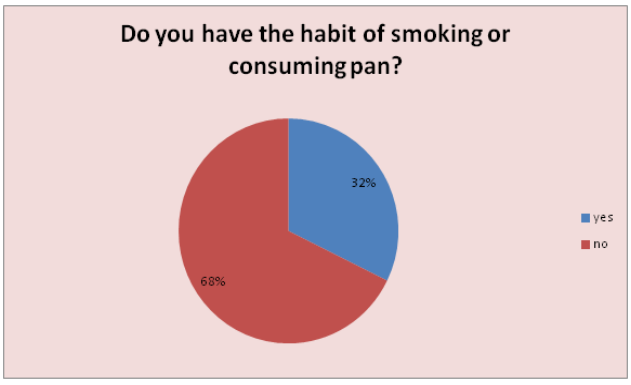
7. 84.54% have staff with clean and clipped nails while 15.45% do not follow this practice



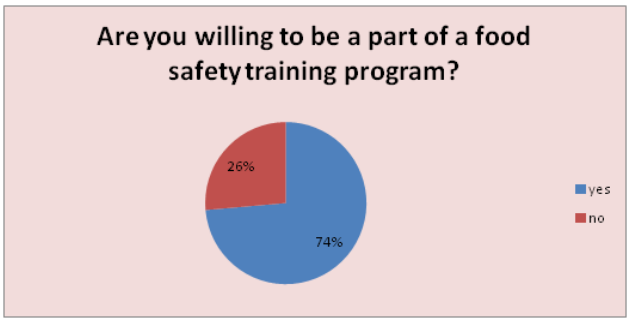
8. In 62.72% outlets the staff work with proper head gears, gloves and aprons. While 37.27% work without these.

9. 86.36% chefs taste the food they prepare of which 80.90%people use different spoons to stir and taste the food, while 19%use the same spoon to stir as well as taste. About 13% chefs do not taste the food prepared.

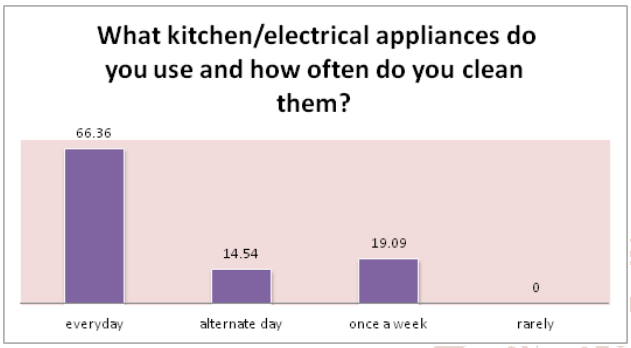




10. 67.72% people do not have the habit of smoking or consuming pan. 32.27% people smoke



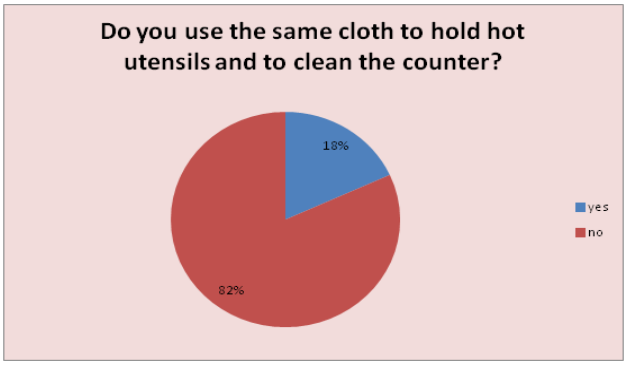
11. 73.62%people showed interest in being part of food safety programs while 26.36% people do not want to be part of any such program.



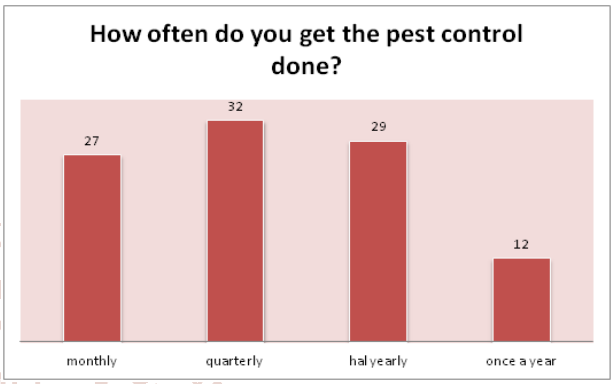
12. Restaurants had a wide range of electrical appliances. Most of outlets nearly 66.36% clean their appliances everyday, 14.54% clean the appliances every alternate day while 19% clean them once a week.

13. 46.36% clean their cooking counters very often nearly 4-5 times a day, 31.81% clean the counters twice a day and 20.90% clean it once a day.

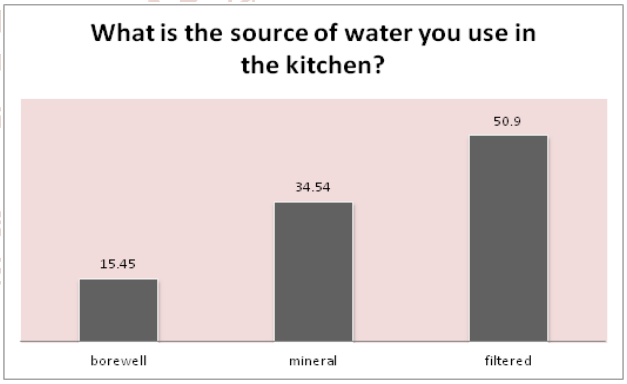
14. In 40% restaurants basic soaps are used for cleaning and 36.36% use powdered detergents.16.36% uses antibacterial liquids like dettol, lizol etc. 7.27% use different products for cleaning



15. 81% people use different clothes to hold hot utensils and clean the counters whereas 18% use the same cloth to both hold and clean

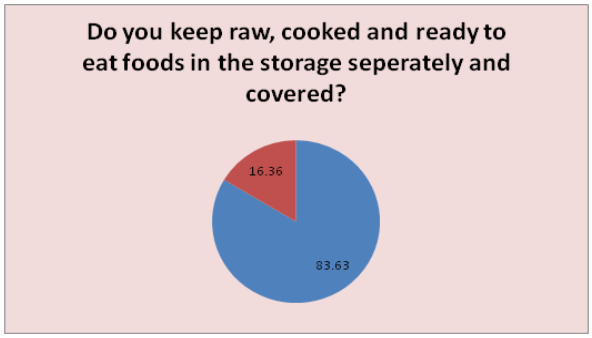


16. 32% restaurants get pest control done every 4 months, 29% do it half yearly and 27% do pest control every month. Only 12% restaurants do the pest control once in a year

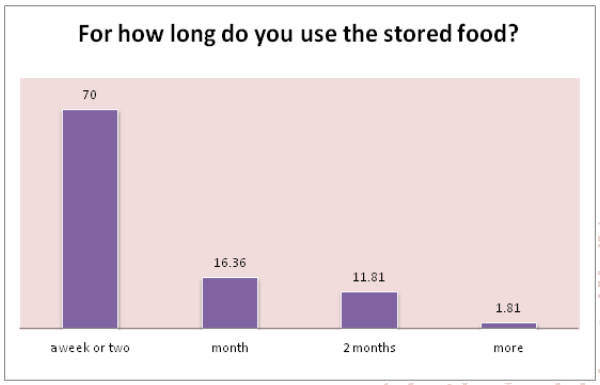


17. 50.90% restaurants use filtered water in the kitchen for all purpose, 34.54% use mineral water and 15.45% restaurants use bore well water in the kitchen

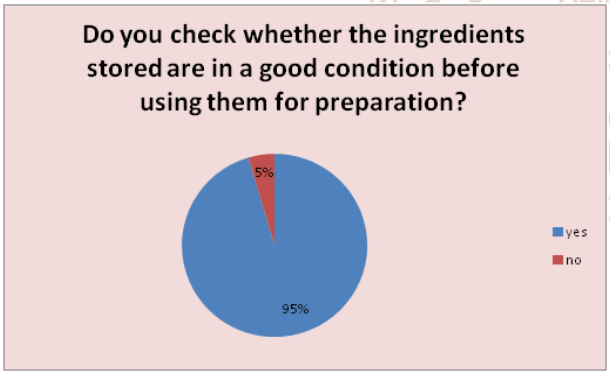
18. Refrigeration is the main form of storage 68.18% of restaurants while 25.45% use walk in freezers.6.36% have other means for storing ingredients like chillers, freezing drawers etc.



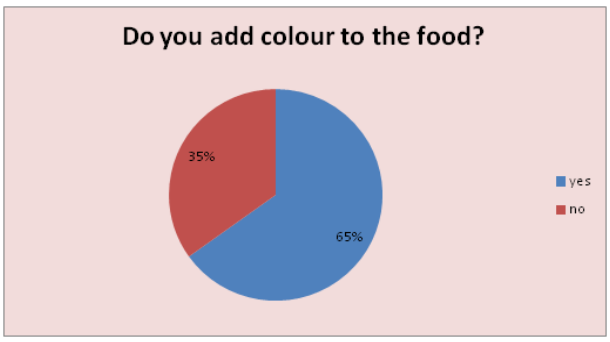
19. 83.63% restaurants prefer to store raw, cooked and ready to eat foods separately and properly covered and 16.36% don't.



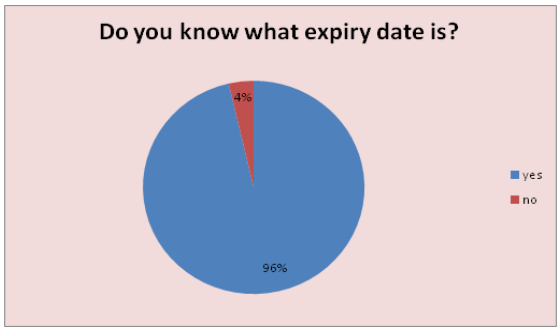
20. 70% restaurants use up the stored ingredients within a week or two. 16.36% use the food for 1 month and 11.81% use the stored food for approx 2 months. Only 1.81% uses the stored food beyond2months.



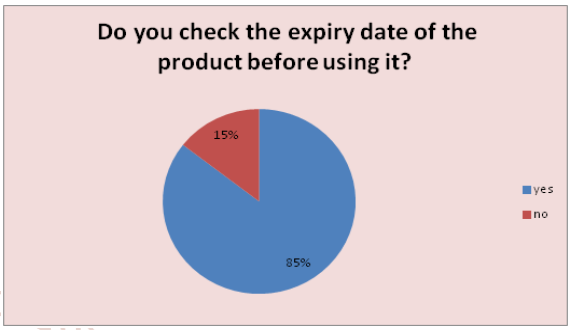
21. 95.45% people check the ingredients every time they use it for preparation while 4.54% don't.



22. 65.45% use artificial color in their food preparation. 34.54% avoid adding of any kind of food color.



23. 96.36% people know what an expiry date means while 3.63% people do not know what expiry date is.

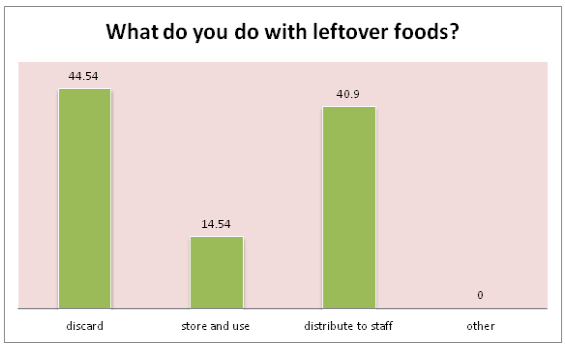


24. 85.45% check the expiry date of the product every time they use it whereas 14.54% people do not check the expiry date.

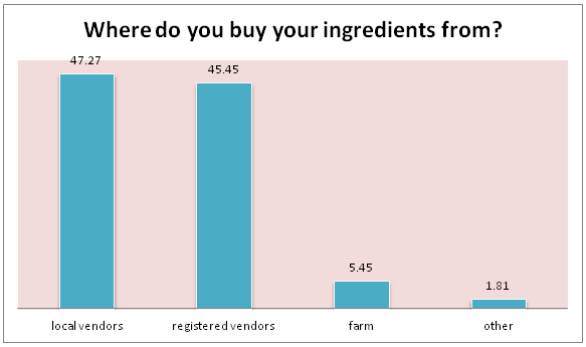
25. most of the restaurants cook the food at a temperature of 100°C and above, and serve it hot at a temperature range of 60°-80°C

26. 63.63%people questioned know what a danger zone is while 36.36% people were unaware of danger zone.

27. Most of the restaurants buy non vegetarian ingredients every day and few buy it once every 2-3 days. Some buy once a week.



28. 44.54% discard the leftover food 40.90% distribute the leftover food among their staff. Only 14.54% store it for future use.



29. 47.27% restaurants buy the raw ingredients from local vendors, 45.45% buy the ingredients from registered vendors. Only 5.45% buy the ingredients directly from the farms and 1.81% buy ingredients from other means.

DISCUSSION

The awareness of such important hygienic procedures by majority of the institutional food-handlers in this study is very appropriate. This is because the hands of food-handlers can serve as vectors in the spread of food borne diseases due to poor personal hygiene or cross-contamination. Proper hand washing by food-handlers has been reported to significantly decrease the threat of diarrheal disease in and can therefore be encouraged as it could similarly help minimize the risk of diarrhea and other food borne diseases in similar institutions.

Hand washing practices should be emphasized to food handlers as the hands need to be washed carefully before touching food or any sort and particularly after handling raw food ingredient, which will introduce bacteria daily to the kitchen and before continuing with Roberts, 1993). (4)

Food handlers should therefore receive suitable training in the basic principles of food safety (WHO, 1998) (5).

Through the data received it was observed that majority of the working staff would gladly like to be a part of food hygiene training program. The program can be conducted among the entire team of managing staff based on the importance of food hygiene, personal hygiene, cross contamination and safer temperatures of cooking, serving and storage of foods.

At the end of the training period, the knowledge and understanding of food safety on the part of food handlers should be tested. The use of attractive and explicit poster-type displays in workrooms is considered to be effective way of reminding food handlers of various aspects of food safety (WHO, 1988b) (6).

CONCLUSION

From the above survey, we are able to draw out various conclusions. We learn that most of the food service establishments in Hyderabad are aware of the basic hygiene practices. They are very particular about the personal hygiene of the staff and sanitation of the food being prepared. We also come to know that they take proper care of the ingredients they use when it comes to selection and storage. We learn that they are concerned about the cleanliness of their establishments and their sanitation and pest control routine. Apart from all of this we can understand the educational qualifications of the people working in such establishments and their interest and vigor in learning more about food sanitation and its importance and methods.

Particular attention should be given to the importance of time and temperature control, personal hygiene, cross contamination, sources of contamination and the factors determining the survival and growth of pathogenic organisms in food (WHO, 1988b; Goh, 1997). (7)

By doing the survey we are able to understand the situation of food sanitation in various establishments in Hyderabad. Such information is very helpful to evaluate the occurrences of food borne illness and helps us come about at various ways in which we can combat it.

From the present study the situation of food sanitation and hygiene practices in various establishments in Hyderabad was concluded. Such information is very helpful to evaluate the occurrences of food borne illness and helps us come about at various ways in which we can combat it.

RECOMMENDATIONS

The following recommendations can be advised.

- Food vendors' education is important issue as the vendors should be adequately educated about the relation between the food and disease transmission as well as on principles of personnel hygiene.
- The major authorities may issue the licenses to the street food vendors only once they fulfil the basic and essential food safety and hygiene principles.
- A routine health examination of the food handlers at these street food stalls must be carried out by the health officers to keep a check and maintain the hygienic conditions at the food stalls.
- Periodic training of these vendors can help improve and maintain the conditions.

REFERENCES

The survey was done taking into consideration the results and the methodology of reference published reports. The referred articles are hereby listed:

[1] Socio demographic characteristics of food handlers and their attitude, knowledge and practice towards food sanitation and safety: MaizunMohd Zain and NyiNyi Naing.

[2] Tauxe RV. Food-borne illnesses: Strategies for surveillance and prevention. National Center for Infectious Diseases, Centers for Disease Control and Prevention, Atlanta. Lancet 1998; 352 (suppl review)

[3] World Health Organization. Report of a WHO Consultation, Health surveillance and management procedures for food-handling personnel. Geneva: World Health Organization, 1988b.

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[5] World Health Organization. Life in the 21st century. A vision for all. The World Health Report. Geneva: World Health Organization, 1998.

[6] World Health Organization. Report of a WHO Consultation, Health surveillance and management procedures for food-handling personnel. Geneva: World Health Organization, 1988b.

[7] Merican I. Typhoid fever: present and future. Med J Malaysia 1997; 52: 299-309.

[8] https://www.fssai.gov.in/home/about-us/introduction.html.

THE EFFECT OF PRE- PREGNANCY HIGH BMI ON MATERNAL AND FETAL OUTCOMES- FROM NUTRITION PERSPECTIVE

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ABSTRACT

Aim : To understand the role of nutrition in Pre - pregnancy High BMI and its effect on maternal and fetal outcomes.

Objective : To study the dietary pattern of Pregnant women with high BMI and to determine the role of nutrition on prevalence of high BMI and its impact on maternal and fetal outcomes.

Materials & Methods : This study was conducted among Pregnant Women attending antenatal clinic of one of the reputed maternity Hospital in Hyderabad. It was carried out on 100 pregnant women who were randomly selected in the antenatal clinic over a period of 2-months from January 2019 to February 2019. A structured questionnaire, which consisted of questions on anthropometric measurements, knowledge, attitude, and practices was employed as a data collection tool and their most recent medical reports were referred to check their biochemical parameters .

Result : It has been found in many studies that women who were falling under the category of overweight & obese before pregnancy were at higher risk of complications, in view of this statement the survey was carried out with 100 women with pre-pregnancy High BMI. The survey concluded that out of 100 women with pre-pregnancy high BMI, 60 were overweight and 40 were obese.

Out of which, 27 had GDM, 12 had Hypothyroidism, 09 had Preeclampsia, 15 had anemia, 14 had other complications like AKI, PPH, G.HTN etc..,

It was also seen that most of the women were non-vegetarians (64%), had a sedentary lifestyle (62%) and underwent Elective and Emergency Cesarean Sections (66%). Also the survey concluded that women gained more weight than the ideal gestational weight gain suggested by IOM according to BMI. 30% of Women gained ideal gestational weight, 14% of them gained less and 56% of them gained more than the ideal recommendations. Fetal complications were FGR and LBW which accounted to 28% and 26% respectively.

From the nutrition perspective it was seen that food groups like cereals, other vegetables and fats & oils were consumed by all the pregnant women (100%) on a daily basis, where as other food groups like green leafy vegetables, meat/chicken/fish, and fruits consumption on a daily basis was 39%, 41%, 55% respectively which is comparatively low. Also Milk & milk products were taken by only 73% of them daily.

Conclusion : From the present study it is found that pre-pregnancy High BMI and the dietary pattern has an impact on both maternal and fetal outcomes. High incidence of Cesarean sections, Gestational Diabetes Mellitus, Anemia, Preeclampsia, Hypothyroidism and fetal complications like Low Birth Weight and Fetal Growth Restriction were observed in women with a poor dietary pattern, sedentary lifestyle and High Pre-pregnancy BMI.

Keywords : High BMI, Nutrition, Food Frequency, Dietary pattern, Maternal Complications, Fetal complications, Gestational weight Gain.

INTRODUCTION : The increasing rate of maternal obesity provides a major challenge to obstetric practice. Maternal obesity can result in negative outcomes for both women and fetuses. The maternal risks during pregnancy include gestational diabetes and preeclampsia. The fetus is at risk for stillbirth and congenital anomalies. Obesity in pregnancy can also affect health later in life for both mother and child. For women, these risks include heart disease and hypertension. Children have a risk of future obesity and heart disease. Women and their offspring are at increased risk for diabetes. Obstetrician-gynecologists are well positioned to prevent and treat this epidemic. [1]

Increased incidence of stillbirths, abnormal growth, cardiac defects, and neural tube defects has been reported in the offspring of obese women after adjustment for various factors including age, familial and lifestyle factors, and ethnicity and. Furthermore, children born to women who enter pregnancy in an obesogenic state are at higher risk for several adverse long-term health outcomes including increased incidence of obesity , cognitive development deficits and ADHD , type-2 diabetes , cardiovascular disease , cancer , and greater all-cause mortality in comparison to children born to lean mothers.[2]

In 2009, the Institute of Medicine (IOM) released new recommendations for gestational weight gain, including specific recommendations for rate of weight gain by pre-pregnancy body mass index (BMI). [3]

MATERIALS & METHOD : This study was conducted among pregnant Women attending antenatal clinic of one of the reputed maternity hospitals in Hyderabad. It was carried out on 100 pregnant women who were randomly selected in the antenatal clinic over a period of 2-months from January 2019 to February 2017. A structured questionnaire, which consisted of questions on anthropometric measurements, knowledge, attitude, and practices was employed as a data collection tool and their most recent medical reports were referred to check their biochemical parameters. A formal permission to conduct the study was obtained from the authorities of the hospital and a verbal consent was obtained from women attending antenatal clinic. A structured interview schedule was used to collect the required information and their most recent medical reports were referred to check their biochemical parameters. A total of 100 pregnant women attending ANC clinic were randomly selected and included in the Study. All the registered pregnant women, those are attending the antenatal clinics were included in the study The data was analyzed using Microsoft excel.

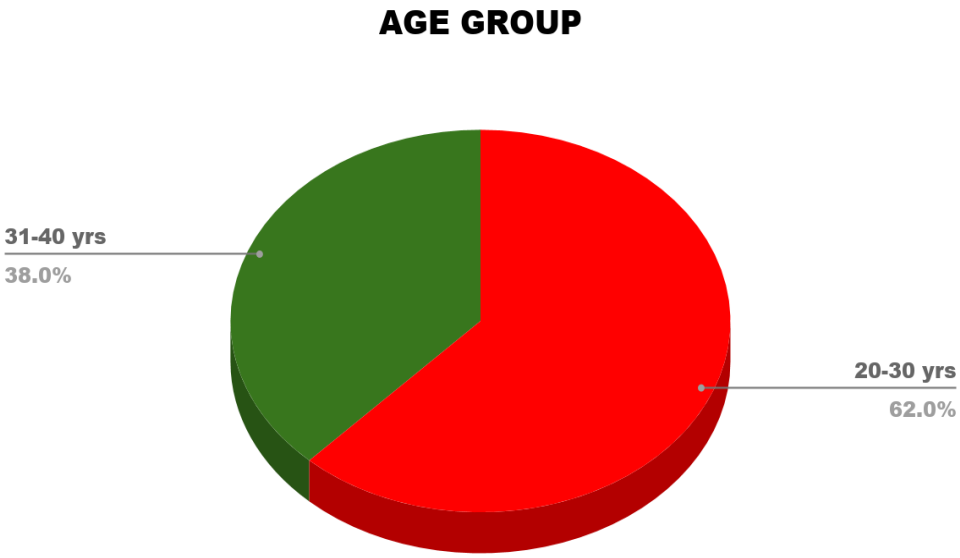
Result : From the present study it was found that 62% of women were in 20-30 year age group and 38% of women were under 31-40 years of age group. Out of 100 respondents, it was seen that 60% of the women were overweight, 40% were obese even before conceiving and 16% of them were overweight, 84% were obese at the end of the pregnancy. The study revealed that 62% of them led a sedentary life while 38% of them had a active one and the diet preferred by 64% was non-vegetarian where as 36% of the pregnant women preferred vegetarian. From the nutrition perspective and food frequency recall it was seen that food groups like cereals, other vegetables and fats & oils were consumed by all the pregnant women (100%) on a daily basis, where as other food groups like green leafy vegetables, meat/chicken/fish, and fruits consumption on a daily basis was 39%, 41%, 55% respectively which is comparatively low. Also Milk & milk products were taken by only 73% of them daily.

It was also found that 20% and 48% of pregnant women underwent Elective and Emergency Cesarean Sections respectively, where as 32.7% had normal vaginal delivery. Also the survey concluded that women gained more weight than the ideal gestational weight gain suggested by IOM according to BMI. 30% of Women gained ideal gestational weight, 14% of them gained less and 56% of them gained more than the ideal recommendations. Present study revealed that 27% had GDM, 12% had Hypothyroidism, 9% had Preeclampsia, 15% had anemia, 14% had other complications like AKI, PPH, G.HTN etc.., Fetal complications were FGR, LBW and Preterm birth which accounted to 28% , 26% and 22% respectively.

Result :

1. AGE GROUP:

Upon analyses of the data, 62% of the respondents were in the age group 20-30 years and the rest of them were in the age group 31-40 years.



2. PRE-PREGNANCY WEIGHT:

PRE-PREGNANCY WEIGHT	NUMBER (n=100)	PERCENTAGE
50-60 kg	18	18%
61-70 kg	32	32%
71-80 kg	30	30%
81-90 kg	20	20%

The above table illustrates that 32% of the pregnant women weighed in between 61-70 kgs,30% of them weighed 71-80 kgs,20% of them weighed 81-90 kgs and the rest 18% of them weighed around 50-60 kgs.

3. PRE-PREGNANCY BMI:

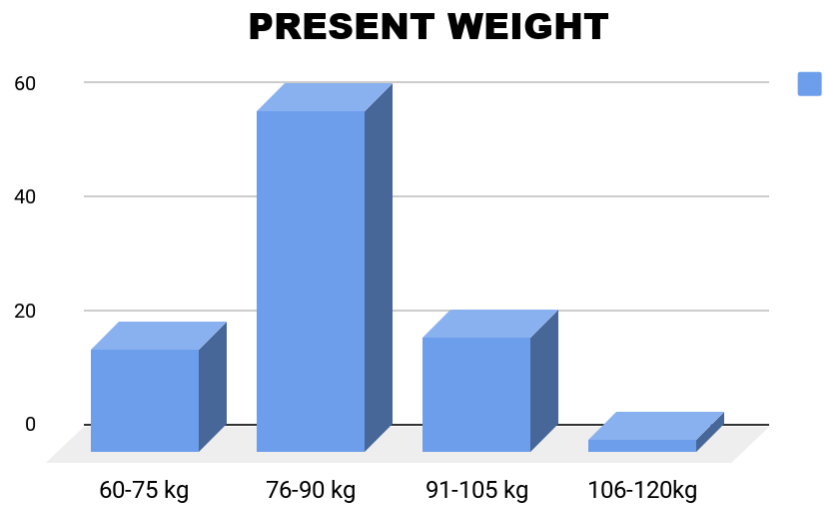
Among the 100 pregnant women,60% of the women were overweight at the time of conception and 40 % of them were obese.

BMI	NUMBER (n=100)	PERCENTAGE
OVERWEIGHT (>25-29.9)	60	60%
OBESE ($\geq$ 30)	40	40%

4. POSTNATAL WEIGHT:

Upon analysis of data,60% of the women had postnatal weight in between 76-90 kgs,20% of them were in between 91-105 kgs,18% of them were in between 60-75 kgs and the rest 2 % were around 106- 120 kgs.

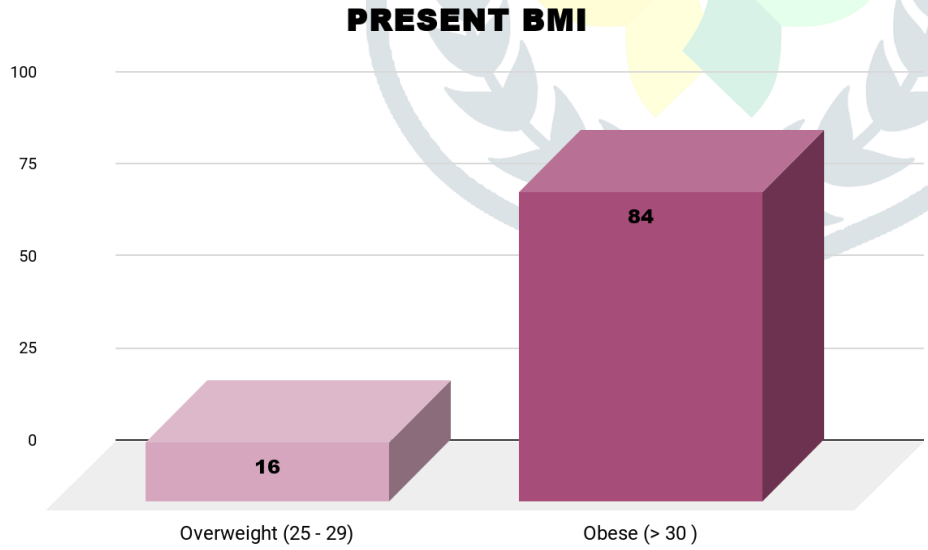
PRESENT WEIGHT	NUMBER(n=100)	PERCENTAGE
60-75 kg	18	18%
76-90 kg	60	60%
91-105 kg	20	20%
106-120kg	2	2%



5. POST-NATAL BMI :

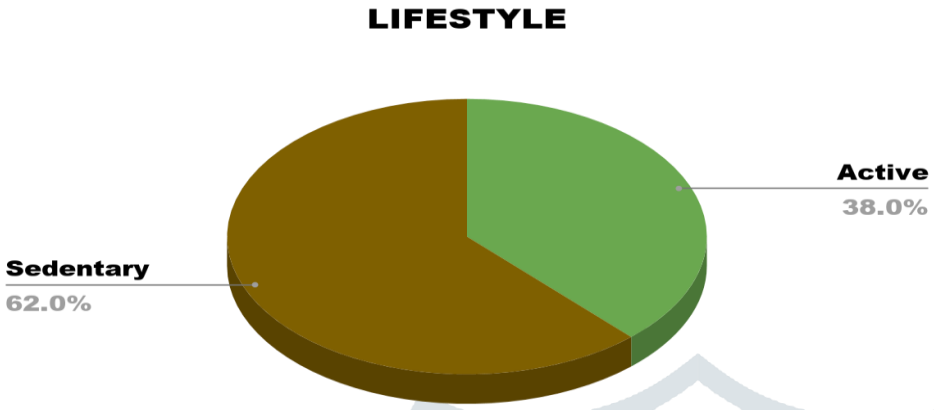
Among the 100 respondents,84 % of the women were obese and 16% of them were overweight.

BMI	NUMBER (n = 100)	PERCENTAGE (%)
Overweight	16	16%
Obese	84	84%



6. MODE OF LIFESTYLE

Upon analysis of data, the study conducted among 100 respondents 38% of the respondents were Active and 62% were sedentary.



7. DIET PREFERENCE

The patients were grouped into two types, based on the diet pattern and preference.

DIET PREFERENCE	NUMBER (n=100)	PERCENTAGE
Vegetarian	36	36%
Non-vegetarian	64	64%

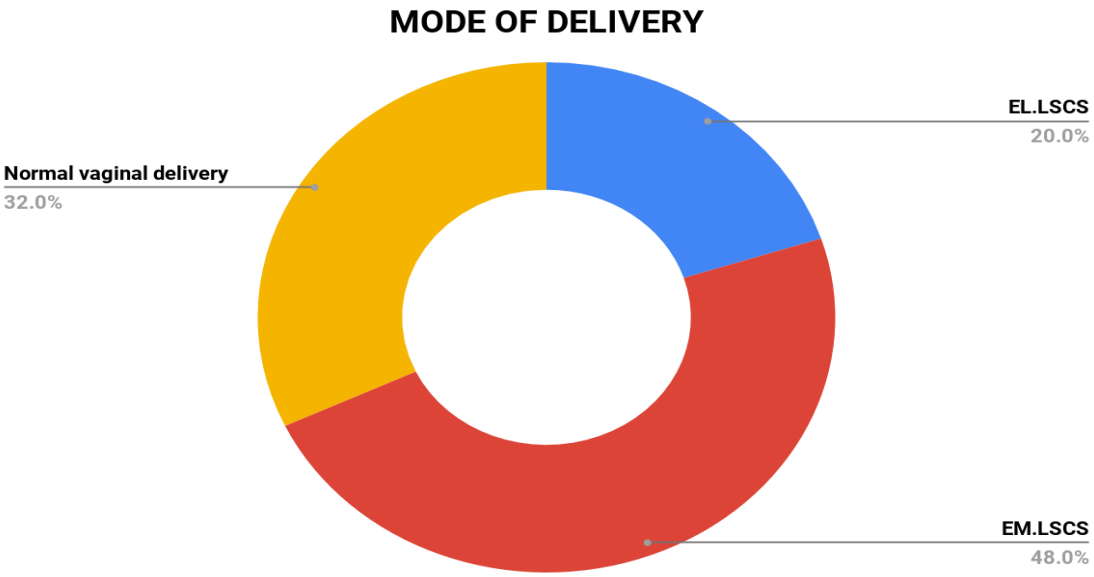
Above table illustrates that most of the high BMI patients were non-vegetarian i.e., 64% and only about 36% women were vegetarians.

8. FOOD FREQUENCY :

The table below illustrates that most of the pregnant women (100%) consume cereals, other vegetables and fats & oils on a daily basis, whereas, the consumption of pulses, Green leafy vegetables, fruits, milk & milk products and high biological value protein sources i.e., meat/chicken/fish daily is 47%, 39%, 55%, 73% and 41% respectively which is comparatively low.

Food Group	Daily	Weekly once	Weekly twice	Monthly
CEREALS	100 %	-	-	-
PULSES	47%	32%	15%	6%
GREEN LEAFY VEGETABLES	39%	43%	10%	8%
OTHER VEGETABLES	100%	-	-	-
FRUITS	55%	30%	8%	8%
MILK & MILK PRODUCTS	73%	10%	15%	2%
MEAT / CHICKEN/FISH	41%	28%	10%	21%
FATS & OILS	100%	-	-	-

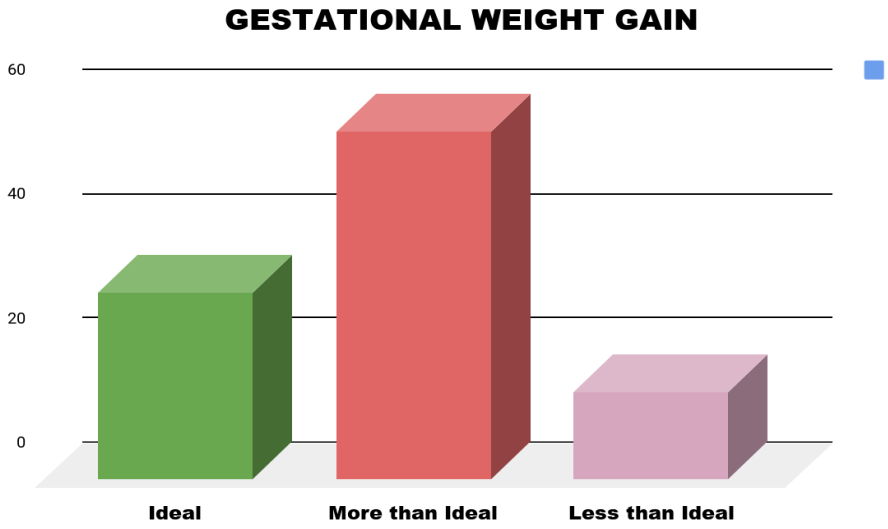
9. MODE OF DELIVERY



Above diagram illustrates that very few of the high BMI patients had a normal vaginal delivery i.e.., 32% and most of them underwent Em.LSCS & El.LSCS i.e., 48% and 20% respectively.

10. GESTATIONAL WEIGHT GAIN :

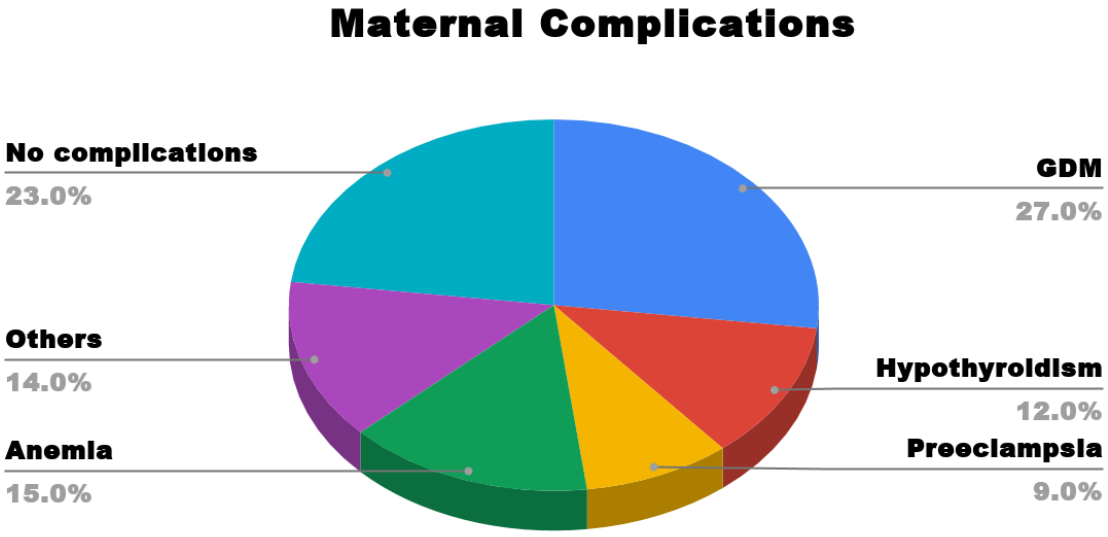
Among the 100 respondents,56% of the women weight gain was more than ideal,30% of the women gained ideal weight and 14% of them gained less than ideal weight.



11. MATERNAL COMPLICATIONS :

Among the 100 respondents, 27% of them had GDM, 12% had Hypothyroidism, 9% had Preeclampsia and 15% had anemia.
It was also seen that 14% of them had other complications like AKI, G.HTN, PPH etc..,

COMPLICATION	NUMBER (n=100)	PERCENTAGE
Gestational Diabetes mellitus	27	27
Hypothyroidism	12	12
Preeclampsia	9	9
Anemia	15	15
Other complications	14	14
No complications	23	23



FETAL COMPLICATIONS :

12. FETAL GROWTH RESTRICTION / STEROID COVER

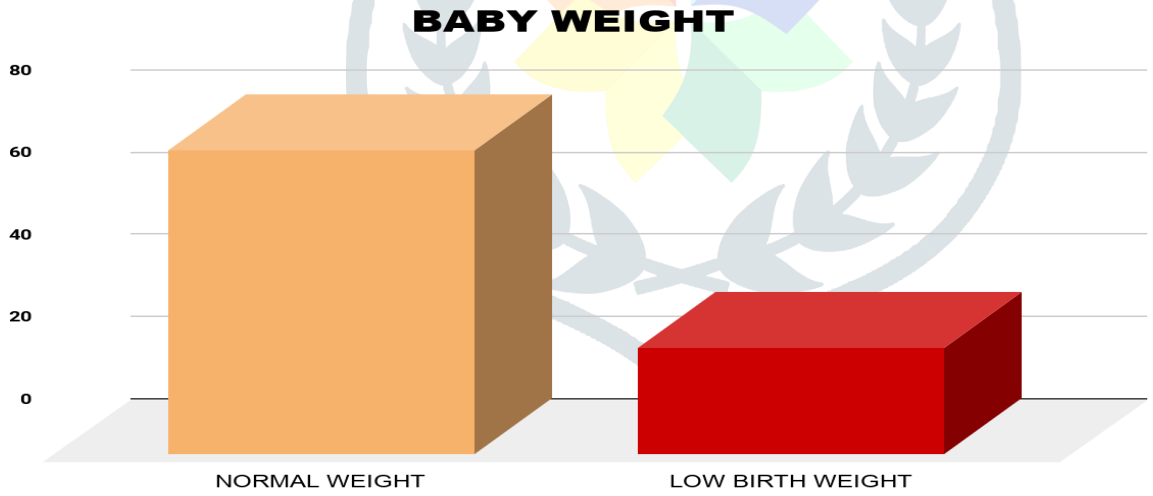
It was also seen in the study that 28% of newborn had fetal growth restriction and were given steroid cover.

FGR/ STEROID COVER	NUMBER (n = 100)	PERCENTAGE (%)
FGR/ Steroid covered	28	28%
No FGR	72	72%

13. BIRTH WEIGHT

From the study conducted, it was seen that 26% of the newborn had low birth weight and 74% had normal weight.

BIRTH WEIGHT	NUMBER (n = 100)	PERCENTAGE (%)
Normal weight (>2.5 - 3)	74	74%
Low birth weight (< 2.5)	26	26%



14. PRETERM BIRTH

Upon the analysis of the data collected from the case files it was found that 22% neonates were preterm and 78% neonates were full term.

TERM/ PRETERM	NUMBER (n=100)	PERCENTAGE (%)
Full term babies	78	78%
Preterm babies	22	22%

Discussion & Conclusion: The health of women, throughout their childbearing ages, should be addressed, to improve their obstetrical and perinatal outcomes. Also, the high risk groups should be managed at tertiary centers.

During the last two decades, there has been an alarming rise in the incidence of obesity all over the world. India is now facing a double burden of this disease with under nutrition and underweight on one side, and a rapid upsurge in obesity and overweight, particularly in the urban settings on the other side. [4]

Maternal obesity is now considered one of the most commonly occurring risk factors seen in obstetric practice. Compared with women with a healthy pre-pregnancy weight, women with obesity are at increased risk of miscarriage, gestational diabetes, preeclampsia, venous thromboembolism, induced labour, caesarean section, anaesthetic complications and wound infections, and they are less likely to initiate or maintain breastfeeding. [5]

The worldwide prevalence of obesity has increased substantially over the past few decades. Economic, technologic, and lifestyle changes have created an abundance of cheap, high-calorie food coupled with decreased required physical activity. We are eating more and moving less. [6]

The present study found that 60% of the women were overweight and 40% of them were obese even before pregnancy due to false dietary habits and low dietary intake of certain food groups which had its impact on maternal outcome as majority of them had Cesarean sections(68%) and other complications like GDM(27%), Hypothyroidism(12%),Preeclampsia(9%), Anemia(15%) etc.., Thus Results of the present study indicate that knowledge, attitude, food habits & practices of the pregnant women on healthy eating and nutrition should be improved and that health and nutrition education of the pregnant women is necessary for a healthy & safe motherhood. Awareness among women on starting a pregnancy with a normal BMI should be widespread.

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A STUDY ON THE DIETARY ASSESSMENT OF WOMEN DIAGNOSED WITH PIH IN HYDERABAD

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Abstract : ***Aim***
The aim of this study is to observe the dietary pattern of women with PIH in their 2nd and 3rd trimesters in Hyderabad
Objective
The objective of this study is to:

a. *Observe the association between diet and PIH.*
b. *Study the dietary pattern of pregnant women suffering from PIH in their 2nd and 3rd trimester.*
c. *Observe the relationship between PIH and its co-morbidities.*

Methods
The inclusion criteria of this study was carried out on 60 women to assess the effect of dietary habits on PIH ,selecting patients who were diagnosed with PIH in their 2nd and 3rd trimester .The data included height, weight (before and after pregnancy), food preferences , biochemical parameters and 24-hour dietary recall . A comparative study was done to see the effect of dietary pattern on PIH.
Results
According to the study, it can be concluded that a diet rich in non -vegetarian and less in fruits and vegetables are more likely to get hypertensive disorders. Most of the population consume non-vegetarian daily which resulted in the change of biochemical parameters in pregnant women. The intake of green leafy vegetables on a daily basis is only 10% while the consumption of non-vegetarian is 50%. The consumption of cereals like wheat and rice are 90% but the intake of millets like ragi and jowar is only 5% .Increased consumption of meat also increased the TSH levels by 20% which in turn pushes the pregnant women's weight .Mediterranean diet which consists of more vegetables, fruits, nuts, fish and vegetables oils are more helpful in avoiding hypertensive disorders in pregnant women like high blood pressure and pre-eclampsia.

I. INTRODUCTION

Hypertension represents the most common complication of pregnancy, affecting up to 15% of pregnancies worldwide. Hypertensive disorders of pregnancy (HDP) include gestational hypertension, generally defined as new-onset hypertension (≥140 mmHg systolic or ≥90 mmHg diastolic blood pressure) arising after 20 weeks' gestation, and pre-eclampsia, defined as gestational hypertension accompanied by proteinuria (excretion of ≥300 mg protein every 24 hours) . [1]These disorders are a major cause of maternal and perinatal morbidity and mortality, and result in an increased future risk for cardiovascular disease and type 2 diabetes mellitus for both mother and offspring. These lifelong and inter-generational adverse health consequences highlight the need for identification of preventive strategies. [6]

CLASSIFICATION[6][1]

The forms of high blood pressure during pregnancy include :

- Chronic hypertension
- Gestational Hypertension
- Pre-Eclampsia.

RISK FACTORS

Age: The risk of preeclampsia is higher for very young pregnant women as well as pregnant women older than 40 years of age.

Chronic hypertension: The risk of developing pregnancy induced hypertension is more if the patient is already suffering from chronic hypertension.

Primi: The risk of developing Gestational hypertension is high during first pregnancy.

Obesity: The risk of preeclampsia is higher if the pregnant woman is obese.

Time Interval between pregnancies: Having babies less than two years or more than 10 years apart leads to a higher risk of preeclampsia.

Multiple pregnancies: Preeclampsia is more common in women who are carrying more than one baby, i.e.; twins, triplets or other multiples.

History of certain conditions: Having various conditions before pregnancy such as chronic high blood pressure, migraine, type 1 or type 2 diabetes, kidney disease, a tendency to develop blood clots, or lupus is known to increase the risk of Gestational Hypertension or preeclampsia.[6][1]

SYMPTOMS OF PREGNANCY INDUCED HYPERTENSION

- High blood pressure (a blood pressure reading higher than 140/90 mm Hg or a significant increase in one or both pressures)
- Proteinuria
- edema (swelling)
- visual changes such as blurred or double vision
- Nausea, vomiting
- right-sided upper abdominal pain or pain around the stomach
- urinating small amounts
- changes in liver or kidney function tests

DIAGNOSIS

Diagnosis is often based on the increase in blood pressure levels, but other symptoms may help establish PIH as the diagnosis. Tests for pregnancy-induced hypertension may include the following:[6][1].

- Blood pressure measurement
- urine test
- assessment of edema
- weight measurements to check weight gain or loss
- Eye examination to check for retinal changes
- Liver function tests
- Kidney Function tests
- Blood clotting tests.

II.RESEARCH METHODOLOGY

2.1Population and Sample

A pooled study of individual-level analysis sampling of 60 pregnant women was done. All the women were diagnosed with PIH in their 2nd and 3rd trimester. Women with or without co-morbidities like obesity and diabetes were included.

2.2 Data and Sources of Data

The study was taken up by 3 students pursuing Post graduate diploma in nutrition and dietetics as a part of their dissertation work. Each student carried the study of 20 subjects individually from various hospitals of Hyderabad, overall 60 subjects were analyzed

A format was designed and pre-tested for undertaking this study and the parameters consisted were patient profile, subjective data, biochemical data, medications given and the patient's 24-hour dietary recall.
Later the data was analyzed, and the comparison was done between before and after weight and biochemical parameters .The data was finally analyzed to conclude the result of the Study.

III. RESULTS AND DISCUSSION

The following are the findings and results of the survey conducted:

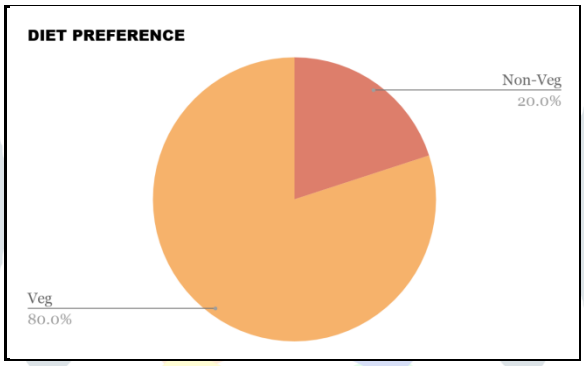
3.1. GENERAL INFORMATION

1. AGE CLASSIFICATION:

S.no	AGE	PERCENTAGE
1	20-25 years	16.66%
2	26-30 years	56.66%
3	31-35 years	16.66%
4	36-40 years	6.66%

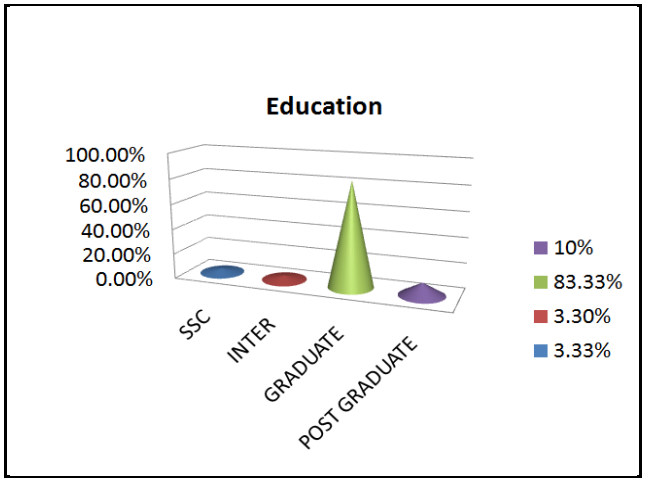
The findings of this study showed that more than 50% of the women diagnosed with PIH lie in the age category of 26-30 years, followed by 20-25 years & 31-35 years with 16.6% of prevalence of PIH. It also stated that >40 years of women are more to PIH , where only 6.6% lies in 36-40 years of age group.

2. TYPE OF DIET PATTERN:



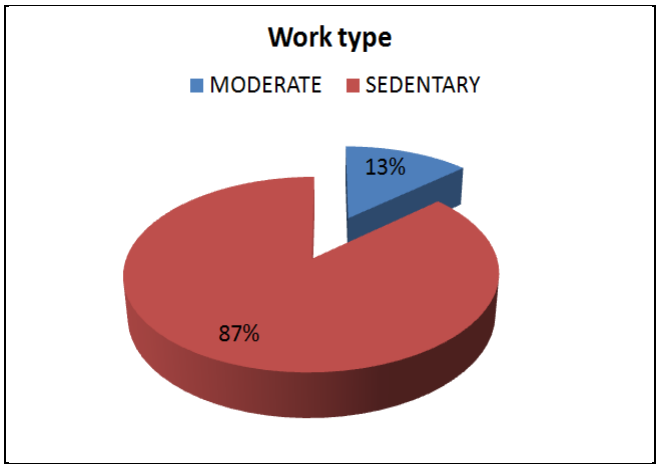
Among the survey conducted 80% of the women were observed to have non-veg as their diet preference whereas 20% were pure vegetarians.

3. EDUCATION



The educational status plays an important role as seen in the findings more than 80% of the women are graduates and has Knowledge about the condition. Whereas 3.3% has completed their secondary education and 10% are post graduates.

4. WORK TYPE

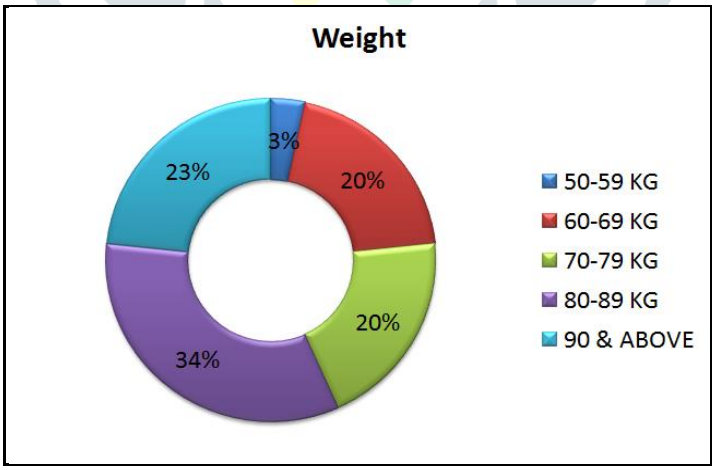


The study shows that about 87% women lead a sedentary lifestyle during pregnancy while the remaining 13% are moderately working

3.2 ANTHROPOMETRIC MEASUREMENTS

5. WEIGHT

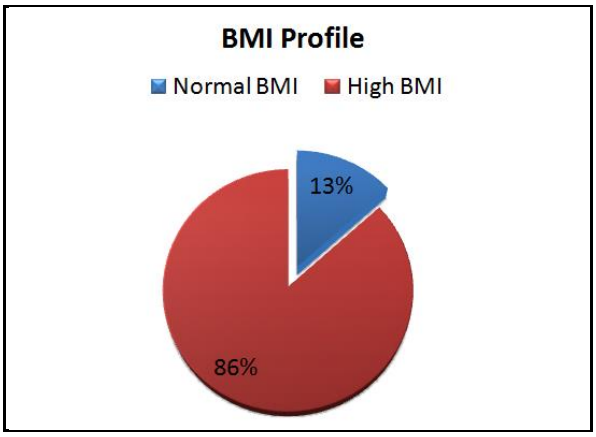
S.No	WEIGHT	PERCENTAGE (%)
1	50-59 KG	3.33%
2	60-69 KG	20%
3	70-79 KG	20%
4	80-89 KG	33.33%
5	90 & ABOVE	23.33%



This study has shown that 34% of PIH women are 80-89 kg followed by 23% who are 90 kg and 40% women are under 60-79 kg category comprising of 20% in every 10 kg. Only 3% of women diagnosed with PIH are in 50-59 kg range of body weight.

6. BMI PROFILE

S.NO	BMI	PERCENTAGE %
1	Normal	13.33%
2	Overweight	43.3%
3	Obese	43.3%



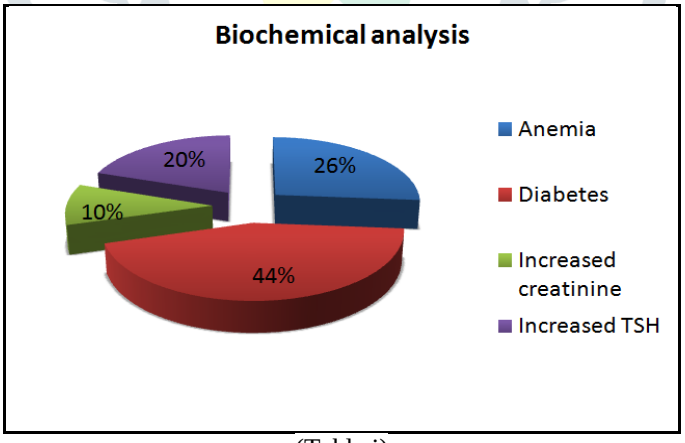
The BMI in this study was observed to be on the very less on the normal range i.e., 18.5-24.5 which is seen to be only 13% , whereas 86% of women has high BMI in which 43.3% are overweight and 43.3% are categorized under obese criteria

3.3 BIOCHEMICAL INVESTIGATIONS

7. BIOCHEMICAL ANALYSIS:

The subjective data of the patients were evaluated and interpreted. The details are shown in the below table(1).

S.No	BIOCHEMICAL PARAMETERS	PERCENTAGE
1	Anemia	26.60%
2	Diabetes	44.66%
3	Increased Creatinine	10%
4	Increased TSH	20%



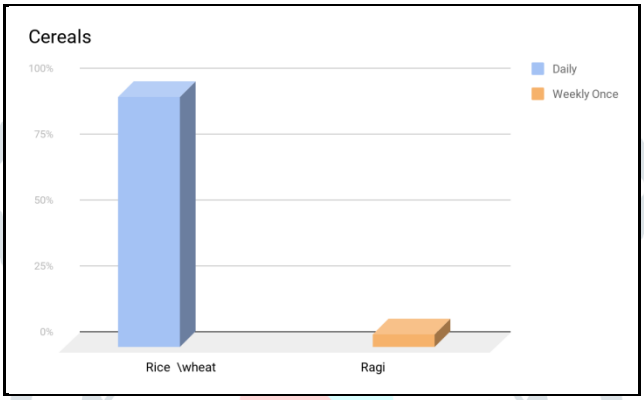
(Table i)

The study also observed the co-morbidities of PIH such as anemia, diabetes, increased creatinine levels and increased TSH levels. Among the survey conducted 44% of women were diagnosed with diabetes, 26% were anemic accompanied by PIH.

3.4 FOOD FREQUENCY

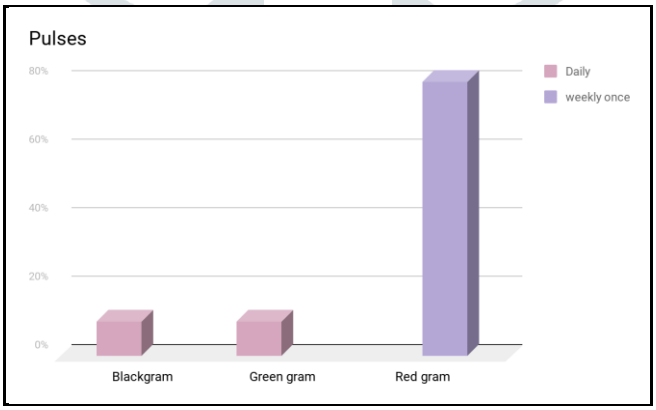
FOOD ITEMS	DAILY	WEEKLY ONCE	WEEKLY TWICE	MONTHLY
CEREALS	Rice, Wheat flour (90%)	Ragi | Jowar (5%)	-	-
PULSES	Black gram (10%) | Green gram (10%)	Red gram (80%)	-	-
GREEN LEAFY VEGETABLES	10%	-	78%	2%
OTHER VEGGIES	65%	25%	10%	-
FRUITS	100%	-	-	-
MILK & MILK PRODUCTS	100%	-	-	-
MEAT / CHICKEN/FISH	50%	30%	20%	10%

1. CEREALS AND MILLETS



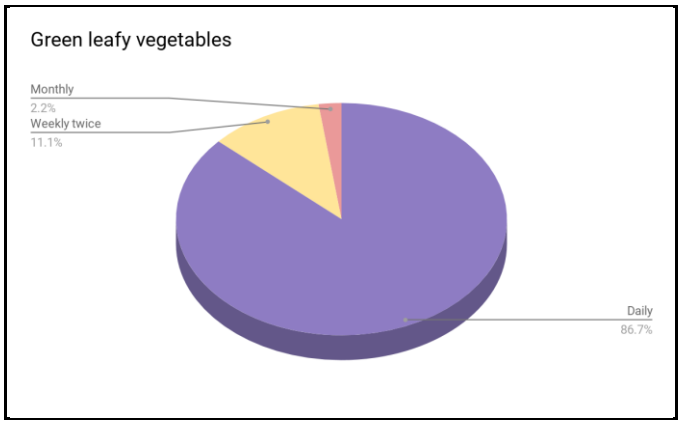
According to this study, about 95% of the cereals consumed on a daily basis are Rice and wheat flour in the form of roti's, whereas about 5% women consumes millets such as jowar or ragi weekly once.

2. PULSES



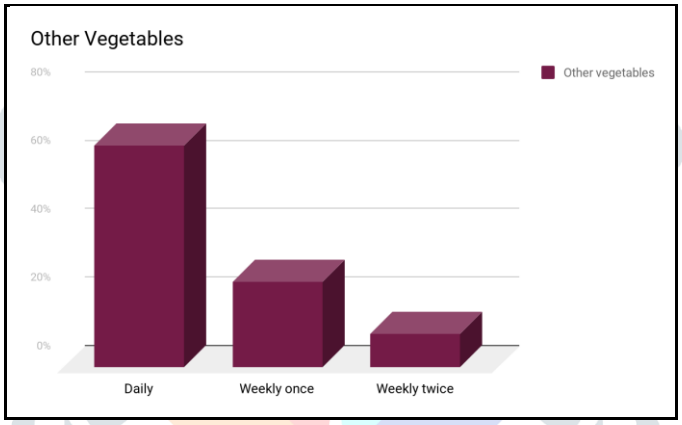
The pulse consumption according to the study shows that, each black gram dal and green gram dal is consumed by 10% of the women on a daily basis, and about 80% of the women consume red gram dal on a weekly basis.

3. GREEN LEAFY VEGETABLES



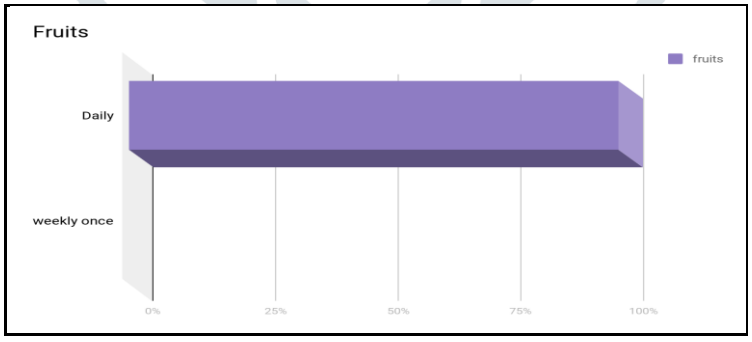
The study shows that, 10% women consumes green leafy vegetables on a daily basis, while about 78% women consumes twice weekly and 2% women consumes once in a month.

4. OTHER VEGETABLES



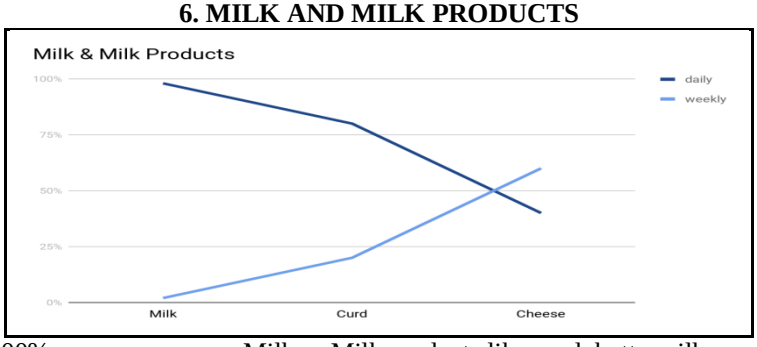
According to the study, the daily consumption of other vegetables is by 65% women, while 25% women consume weekly once and 10% consumes twice a week.

5. FRUITS



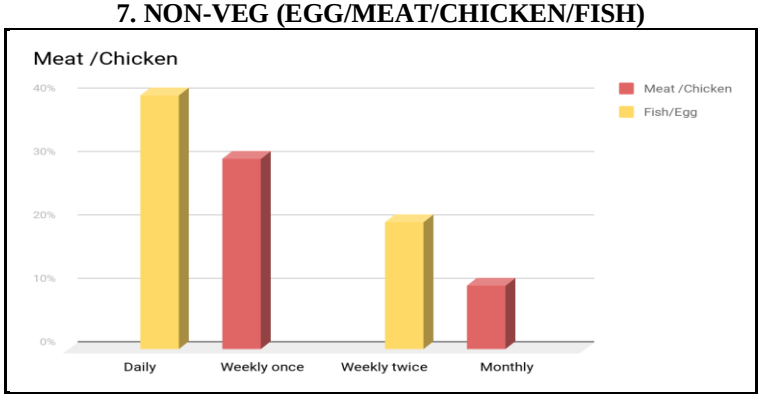
The study shows, 100% women eats at least one or more fruits daily.

6. MILK AND MILK PRODUCTS



The Study shows that 100% women consume Milk or Milk products like curd, buttermilk, paneer etc on a daily basis.

7. NON-VEG (EGG/MEAT/CHICKEN/FISH)



According to this study, among the Non-Vegetarian women, Consumption of non-veg in the form of Egg, Meat, Fish or Chicken is by 40% of the women on a daily basis, 30% women consumes once in a week, about 20% consumes twice a week and 10% consumes once in a month.

IV.SUMMARY AND CONCLUSION

According to some studies diet does not play a primary role in causing PIH, but in this study it is observed that a patient consuming diet rich in non –vegetarian food sources and less in fruits and vegetables are more likely to get hypertensive disorders .The consumption of foods low in sodium does plays an important role by maintaining the serum Creatinine levels and TSH levels.

The amount of physical activity correlates with the comorbidities of PIH during the initiation of 2nd and 3rd trimester. This study can be concluded by stating that a diet rich in dairy products, plenty of green leafy vegetables, potassium rich foods and enough amounts of high biological value protein sources can prevent PIH with plenty of oral fluids

II. ACKNOWLEDGMENT

We express deep sense of gratitude to Mrs. Meena Kumari, Head of Nutrition department, St. Ann's College for Women for providing us an opportunity of doing this project work.

We am deeply indebted and grateful to Ms. Nasreen Begum, Lecturer, Department of Nutrition, St. Ann's College for Women for her continuous guidance, constant support and valuable suggestions all through this project work.

This acknowledgement will be incomplete if we fail to express my deep sense of gratitude to my group members and friends, for their patience and support without which this would not have been successfully completed

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TO STUDY VARIOUS CO-MORBIDITES AMONG HEMODIALYSIS PATIENTS

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ABSTRACT
AIM: To study various co-morbidities among hemodialysis patients.

OBJECTIVES: To assess renal function by measuring serum creatinine, urinary Creatinine and blood urea and to evaluate the co morbidities among dialysis patients.

METHODS: The sample population (n=20) was chosen from one of the Hospital of Hyderabad. All the patients were of different age groups, sex, Biochemical parameters, food frequencies and with different co-morbidities. A format consisting of patient profile, subjective data, objective data, biochemical data and 24 hr recall followed during hospital stay

RESULTS: Among 20 subjects the study identified the co morbidities of hemodialysis patients. Hypertension and anemia are the major co morbidities for dialysis patients The bio marker studies showed a higher risk in age group of 41-50 years and mostly in males. Majority of the patients are with elevated serum creatinine, urea and low hemoglobin.

CONCLUSION: From the above results, it is very clear that Hypertension and Anemia are the major co morbidities and seen mostly in the age group of 41-50 among dialysis patients. And associated with elevated renal and blood biochemical parameters. Other co morbidities includes Diabetes mellitus, cardiovascular diseases, renal calculi, pyelonephrities.

KEY WORDS: Chronic Renal Failure, dialysis, hypertension, anemia, cardiovascular diseases, elevated creatinine, proteinuria.

INTRODUCTION

Chronic renal failure is slow gradual loss of kidney function, some forms of CRF can be controlled of slowed down, but never cured. It is a condition that arises due to advanced and progressive damage of kidneys with impairment of renal function. Few functional nephrons remains and chronic renal failure results usually termed as uremia .chronic renal failure can range from mild dysfunction to severe kidney failure. It leads to severe illness and requires some form of renal replacement therapy such as dialysis, is called as End stage Renal disease.

Symptoms: progressive loss of nephrons and decrease in renal blood flow and glomerular filtration rate, sodium depletion, high serum potassium, edema, high blood pressure; loss of appetite, nausea, vomiting and hiccups.

Co morbidities: It includes hypertension, renal vascular diseases, chronic pyelonephritis, congenital abnormalities of both kidneys, Diabetes mellitus; these can cause extensive changes in kidney structure and function. It results in accumulation of fluids and waste products which lead to many complications.

Dialysis: It involves cleaning the blood of metabolic wastes, based on the principle of osmosis and diffusion. A semi permeable porous membrane is used to separate the blood carrying excess fluid and metabolic wastes, and hypotonic, dialysis fluid called as dialysate. It is a procedure that replaces some of the kidney normal functions. Mostly performed when a person has more than 95% of kidney failure. Dialysis specifically involves artificial filtering of blood by a machine, and it is a catabolic process. Like healthy kidneys, dialysis keeps the body in balance by removing waste products including salt and excess fluids, maintains a safe level of blood chemicals. There are 2 types of Dialysis.

1. Hemodialysis: An artificial kidney; haemodialyser is used to remove the waste products from the blood and restores body's chemical balance. In this the blood circulates, outside the body through commonly referred to as artificial kidney machine. An opening is created to connect an artery and a vein. In this less protein is lost than with peritoneal dialysis. In this patients usually have poor appetite.

2. Peritoneal dialysis: In this; the blood is cleaned continuously within the body, the blood stays in blood vessels, which line the patients abdominal peritoneal space, used as a semi permeable membrane and excess water and metabolic wastes removed by injecting the dialysis fluid into peritoneal cavity, its types includes Intermittent, Continuous cycling and Continuous ambulatory. The dialysate is slowly filled through catheter. Exchange volumes during peritoneal dialysis is commonly 1 – 3 liters' each hour

Complications of dialysis:

Hypo tension; this is the low blood pressure, most common and has several causes like brain does not receive enough blood, fainting or dizziness.

Fluid overload: patients can sometimes develop fluid overload.

Discomfort is seen when needles are inserted for hemodialysis, which commonly called bleeding from access point.

Most of the patients undergo symptoms like, restlessness, blurred vision, seizures, nausea and vomiting, headache and backache and chest pain.

It can only control the kidney failure and does not cure the diseased kidneys, it is too expensive and need to continue throughout their lives or until they receive a kidney transplant.

0bjectives:

- The objectives include maintaining fluid imbalances.
- To correlate the levels of above biochemical parameters with clinical finding to get an insight into the basic pathology of disease.
- To assess renal function by measuring serum creatinine, urinary Creatinine and blood urea.
- To evaluate the co morbidities among dialysis patients.

REVIEW OF LITERATURE

DIABETES MELLITUS:

Diabetic patients have a high risk of developing micro- and macro vascular complications such as retinopathy, cardiovascular disease and renal disease. According to data in the ERA-EDTA Registry, 23% of the incident end-stage renal disease patients had diabetes as primary renal disease. Survival of diabetic dialysis patients appears inferior compared to ESRD patients without diabetes mainly due to cardiovascular disease. Mortality in the diabetic dialysis population is high but varies significantly among patients

Diabetes mellitus is the leading cause of chronic kidney disease (CKD) in the U.S., accounting for approximately 44% and 38% of incident and prevalent cases of end-stage renal disease, respectively.1 While the total number of new patients with ESRD due to diabetes continues to rise (i.e., 49,603 new cases in 2011), there has been a plateau in the incidence rate over the past decade (i.e., 159 new cases per million in 2011). Over the past decade, the mortality rates for diabetic dialysis patients have also declined (i.e., 90 vs. 71 deaths per 1000 patient-years of at-risk time in 2000 vs. 2011, respectively). However, diabetic dialysis patients continue to have poor survival (i.e., 34% over 5 years), worse than those with ESRD due to hypertension and glomerular disease.[1]

HYPERTENSION:

Hypertension is common, difficult to diagnose, and poorly controlled among patients with ESRD. Hypertension is a frequent finding in both acute and chronic kidney disease, particularly with glomerular or vascular disorders. The pathogenesis and preferred treatment of hypertension vary with the type of renal disease and its duration [2]

The prevalence of HTN in the total group of patients with renal diseases was 60.5%. The prevalence of HTN was practically universal in patients with renal vascular disease (93), 63% of the patients with chronic pyelonephritis and 54% of the patients diagnosed with glomerulonephritis were hypertensive. The prevalence of HTN in patients with renal insufficiency (80%) is significantly higher than that in patients without renal insufficiency (43% $P<0.001$). In a multiple logistic regression analysis, the independent risk factors defining HTN in renal patients were: renal failure, age, the presence of diabetes, hyper triglyceridaemia and proteinuria. [3]

CARDIO VASCULAR DISEASE:

Cardiovascular disease is a major concern for patients with end-stage renal disease (ESRD), especially those on hemodialysis. ESRD patients with coronary artery disease often do not have symptoms or present with atypical symptoms. Coronary lesions in ESRD patients are characterized by increased media thickness, infiltration and activation of macrophages, and marked calcification. Cardiovascular disease (CVD) is the main cause of death in patients with ESKD. It is estimated that ESKD patients are 5 to 20 times more likely to die because of cardiovascular causes than the general population [4]

It is estimated that 300,000 patients have chronic kidney disease in Peru, and more than 9,000 of them require renal replacement therapy The incidence of ESKD patients receiving hemodialysis is increasing over time however the prevalence of CVD in these patients remains to be estimated.[5]

RENAL CALCULI:

The incidence of renal stones in patients on dialysis, while lower in number compared to the general population because of decreased renal function, is nonetheless a clinical dilemma. It is estimated that between 5 and 13% of all dialysis patients will develop symptomatic renal calculi and many more asymptomatic calculi. Many of the stone-forming dialysis patients will have recurring stone disease with one study finding an 83.3% recurrence rate.[6]

During a mean of 8.6 yrs of follow-up, stone formers were at increased risk for a clinical diagnosis of CKD, but an increased risk for ESRD or death with CKD was NS. Among patients with follow-up serum Creatinine levels, stone formers were at increased risk for a sustained elevated serum Creatinine and a sustained reduced GFR [7]

ANAEMIA:

The overall cost and health-related quality of life associated with current treatments for chronic kidney disease (CKD)-related anemia is not well characterized. Original studies published between January 1, 2000 and March 17, 2017 meeting the following criteria were included: adult population; study focus was CKD-related anemia; included results on patients receiving iron supplementation, red blood cell transfusion, or erythropoiesis stimulating agents (ESAs); reported results on Harold and/or costs.[8]

PULMONARY TUBERCULOSIS:

The incidence of tuberculosis (TB) has been increasing worldwide. One in every three people in

the world is infected with the tubercle bacillus bacteria (Hung et al., 2004). Many risk factors are associated with TB, such as human immunodeficiency virus (HIV) infections, transplant recipients, substance abuse, renal insufficiency, malignancy, and low socio-economic status (Lee et al., 2009; Li et al., 2011).

Increased TB incidence is also seen in dialysis patients (1974; 2010). Because of cellular immunity defects, patients with end-stage renal disease (ESRD) are at increased risk of developing TB (1994, 2001; 2007.2010). The incidence of TB in dialysis patients is 6–16 times higher than that in the general population (2001; 2006; 2009). However, the clinical manifestations of TB in patients on dialysis are quite non-specific (1999.2001, 2004), making a timely diagnosis difficult. Moreover, the infected locations are often extra-pulmonary (1998; Nakamura et al., 2009). Here we report four cases of extra-pulmonary TB in ESRD patients on dialysis.[9]

HEPATITIS:

After screening of 7311 documents, 56 studies were selected reporting the prevalence of HCV infection among hemodialysis patients from 10 countries of the region. Seven countries including United Arab Emirates, Afghanistan, Qatar, Bahrain, Kuwait, Oman, Israel, and Cyprus did not have any relevant document; thus, their latest reports were just mentioned. We performed the meta-analysis and determined the prevalence rates for each country as well as the whole region. The overall HCV infection prevalence among hemodialysis patients in the region was reported to be 25.3%; Egypt and Syria had the highest reported rates while Iran and Lebanon had the lowest. Further investigations are still needed to provide more reliable databases, find main risk factors, and to improve diagnosis and treatment plans, particularly in higher prevalent countries.[10]

PYELONEPHRITIS:

Emphysematous pyelonephritis (EPN) is a rare but serious necrotizing infection of the kidney, associated with the presence of gas in the kidney and peri -renal tissue. The most common pathogens are Escherichia coli and Klebsiella pneumonia.[13]

The incidence rate (IR) of first-time hospitalization for pyelonephritis was 18.5 (95 % confidence interval per 1,000 person-years of follow-up, among renal transplant recipients ($N = 2,656$) and 0.26 per 1,000 PYFU among population controls ($N = 49,226$) yielding an incidence rate-ratio (IRR) of 72.0 (95 %).[14]

METHODOLOGY

DESCRIPTION: The present study was conducted among 20 patients Underwent hemodialysis in a multi specialty hospital. A Structured questionnaire was administrated along with 24 hour recall and food frequency.

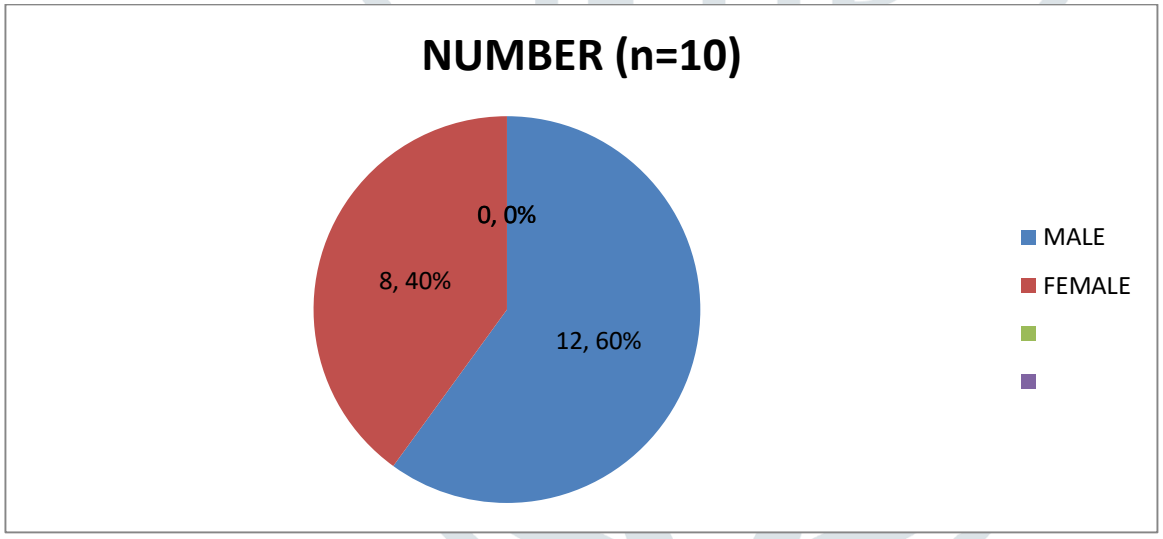
MATERIALS AND METHODS: In this study, designed the questionnaire method, for optimizing the detailed information among dialysis patients, like several co morbidities, biochemical parameters, and functional impairment, their past and present illness, subjective and objective data, medications, patients 24 hour dietary recall, food frequency, food habits, and diet on discharge of individual subject were followed. The entire data was collected, recorded and analyzed.

GENDER CLASSIFICATION:

The total numbers of patients assessed were 20 of which male and female patients were.

Table (1) gives the break up

TABLE (1)



GENDER	NUMBER (n=10)	PERCENTAGE
MALE	12	120%
FEMALE	8	80%

From the above Pie chart male patients are about 12 and females are of 8. Men patients and women patients have different symptoms. Men will have decreased libido and women patients will have irregular menstruation. The impaired kidneys cannot inactivate estrogens' hormone and many men patients will become feminised and have the signs of female such as enlarged breast, reduced body hair, etc.

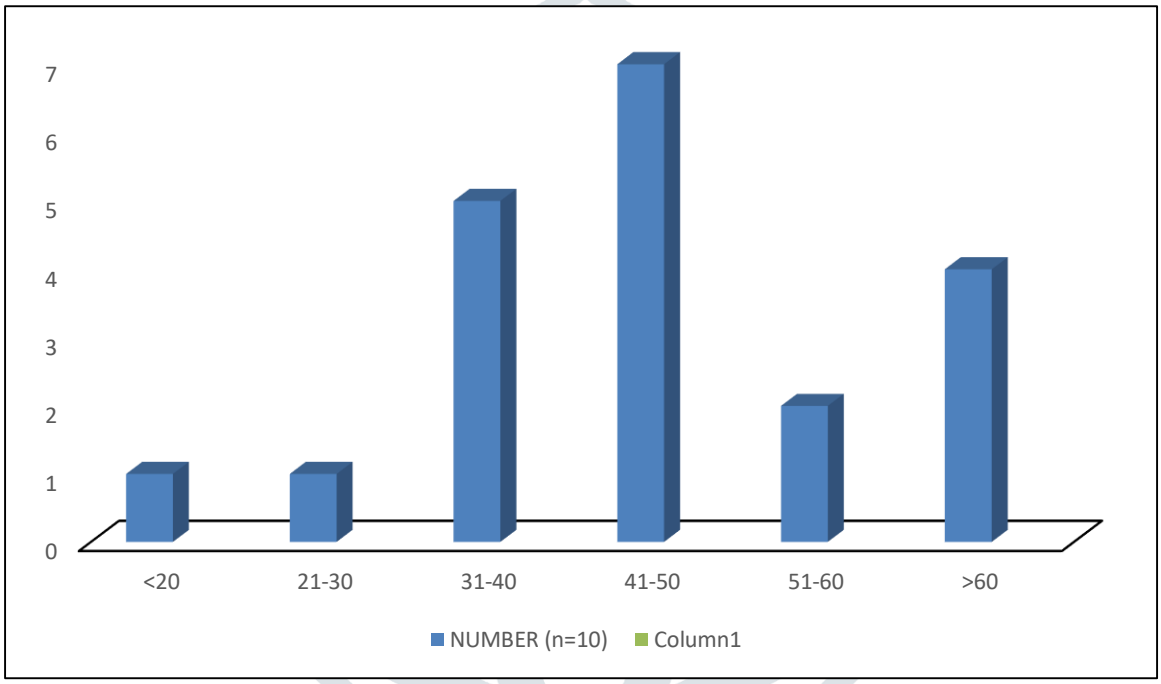
Other symptoms that both men and women patients are having high blood pressure, fatigue, anaemia, swelling, proteinuria, hematuria.

AGE CLASSIFICATION:

The age distribution of the patients is shown in table (2)

TABLE 2

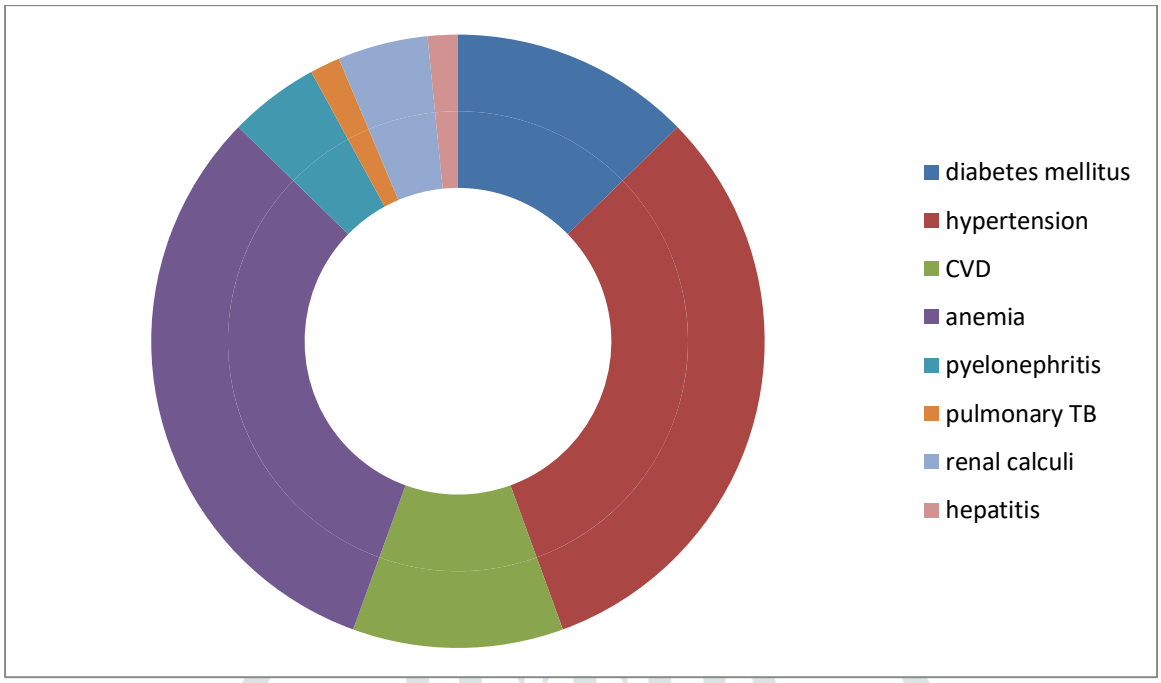
AGE (years)	NUMBER (N=10)	PERCENTAGE (%)
<20	1	10%
21-30	1	10%
31-40	5	50%
41-50	7	70%
51-60	2	20%
>60	4	40%



- From the collected data the above bar graph represents that most of the patients assessed were of about 41- 50 years of age. To estimate gender disparities, we calculated the male: female all-age prevalence rate ratio for each IKF condition. Global number of individuals with IKF reached 752.7 million, including 417.0 million females and 335.7 million males.[15]

CO- MORBIDITES:

CO-MORBIDITES	NUMBER	PERCENTAGE
Diabetes mellitus	8	80%
Hypertension	20	200%
Cardiovascular problem	7	70%
Anemia	20	200%
Pyelonephritis	3	30%
Pulmonary tuberculosis	1	10%
Renal calculi	3	30%
Hepatitis	1	10%

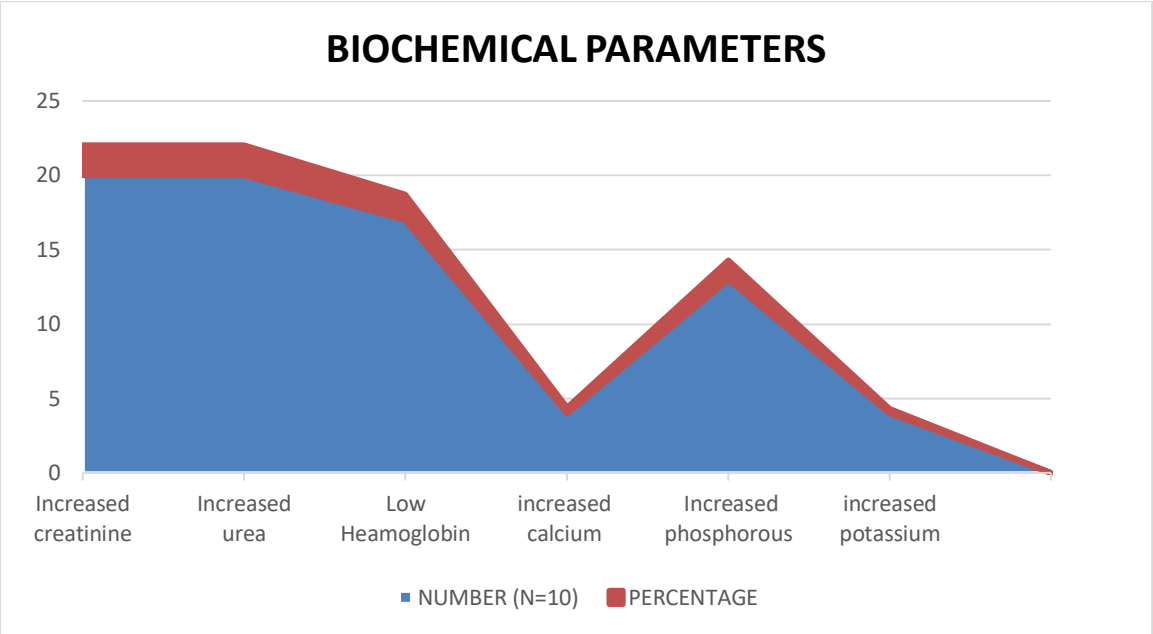


The prevalence of HTN in the total group of patients with renal diseases was 60.5%. Whereas 54% of the patients diagnosed with glomerulonephritis were hypertensive. In a multiple logistic regression analysis, the independent risk factors defining HTN in renal patients were: renal failure, age, the presence of diabetes, hyper triglyceridaemia and proteinuria. Anemia is a condition in which the body has fewer RBC than normal. It tends to worsen as CKD progresses. Most people who have total loss of kidney function, or kidney failure have anemia.

BIOCHEMICAL PARAMETERS:

The biochemical data of the patients were evaluated and interpreted. The details are given in table (3)

BIOCHEMICAL PARAMETERS	NUMBER (N=10)	PERCENTAGE
Increased creatinine	20	200%
Increased urea	20	200%
Low Haemoglobin	17	170%
increased calcium	4	40%
Increased phosphorous	13	130%
increased potassium	4	40%



From the collected data above bar graph indicates that all the patients assessed were having increased urea, creatinine and low levels of hemoglobin with increased phosphorous .Increased levels of urea and Creatinine, excretion in blood by impaired kidneys made vary complication in patients with renal failure before hemodialysis. Extra phosphorous causes a body changes that pulls calcium out of bones making them weak. [11]

FOOD FREQUENCY:

PULSES:

FREQUENCY	NUMBER	PERCENTAGE
Daily	10	100%
Alternative days	3	30%
Weekly thrice	3	30%
Weekly once	5	50%

MILK & MILK PRODUCTS:

FREQUENCY	NUMBER	PERCENTAGE
Daily	18	180%
Alternative days	0	0%
Weekly once	0	0%
No	2	20%

VEGETABLES:

FREQUENCY	NUMBER	PERCENTAGE
Daily	16	160%
Alternative days	1	10%
Weekly thrice	3	30%

NON-VEG:

FREQUENCY	NUMBER	PERCENTAGE
Daily	0	0%
Weekly 2-3 times	3	30%
Weekly once	11	110%
No	6	60%

GREEN LEAFY VEGETABLES:

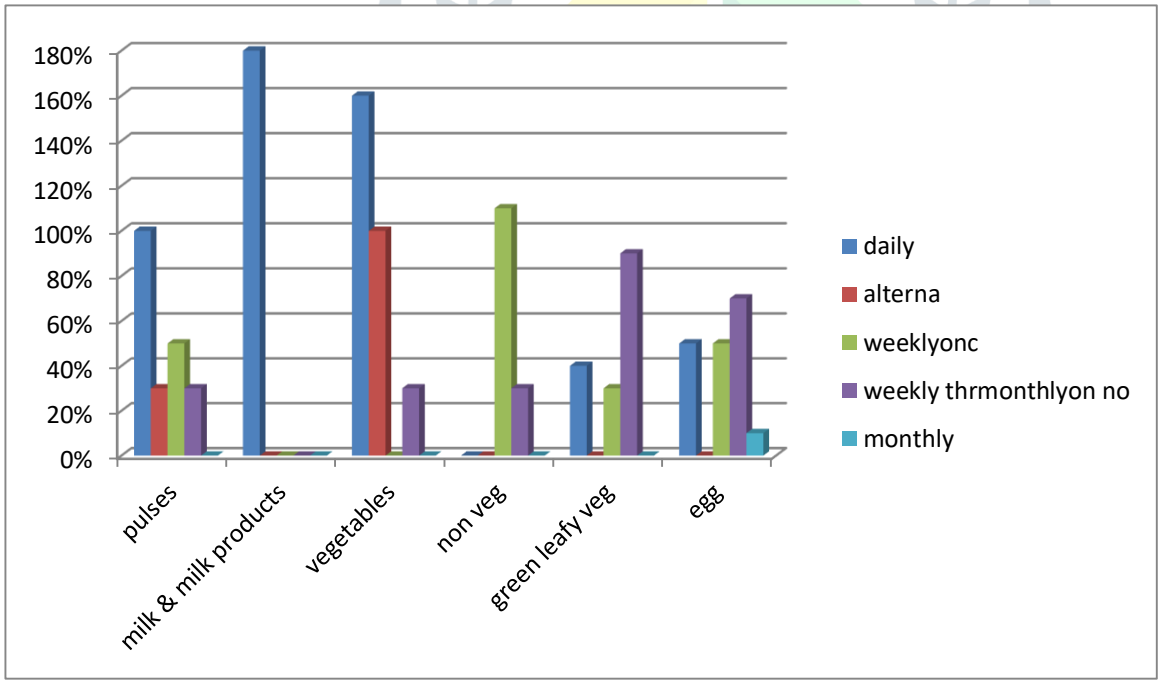
FREQUENCY	NUMBER	PERCENTAGE
Daily	4	40%
Weekly 2-3 times	9	90%
Weekly once	3	30%
No	4	40%

EGG:

FREQUENCY	NUMBER	PERCENTAGE
Daily	5	50%
Weekly 2-3 times	7	70%
Weekly once	5	50%
Monthly once	1	10%
No	2	20%

FRUITS:

FREQUENCY	NUMBER	PERCENTAGE
Daily	6	60%
Alternative days	4	40%
Weekly thrice	6	60%
Monthly once	3	30%
No	2	20%



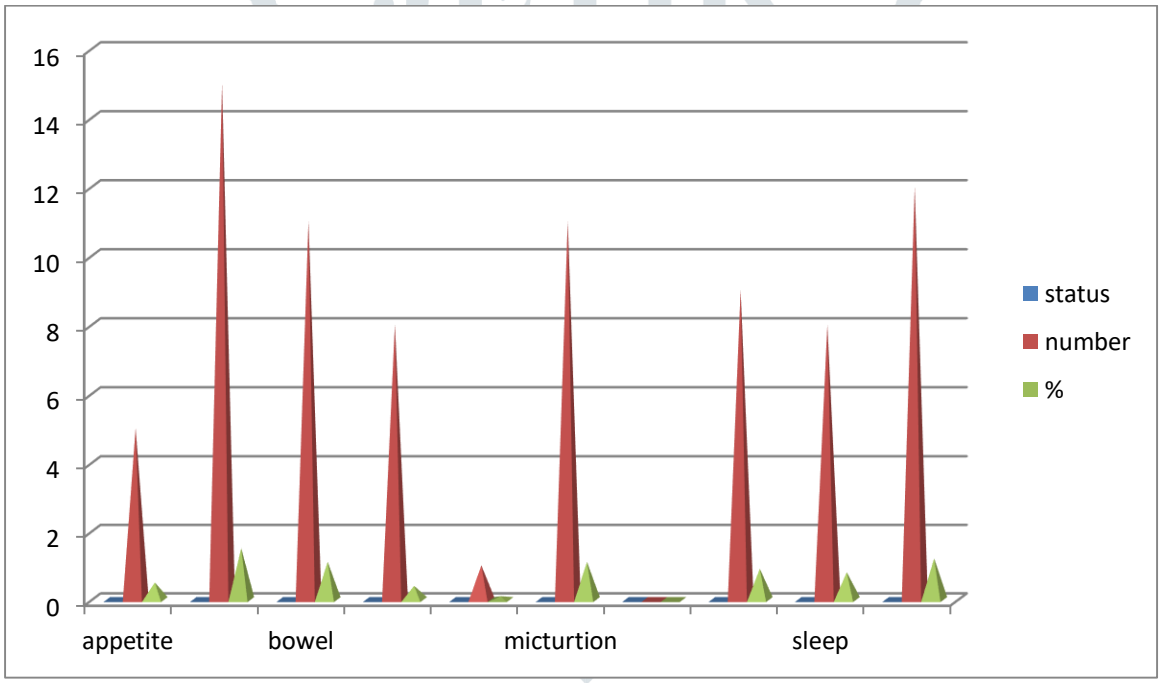
From the collected data, many of them are not consuming sufficient amount of food group and their intake of quantity of protein is less as most of them are from vegetarian.

Even though they are consuming all types of food groups, but their intake of quantity is less due to poor GI function, poor dietary habits and poverty as with increased intake of energy dense foods and limited fruits and vegetable intake fresh fruits and vegetables are often not readily available in low income communities and if available they are expensive compared to other foods.[12]

SUBJECTIVE DATA:

Subjective data of the patients were estimated in the table (5)

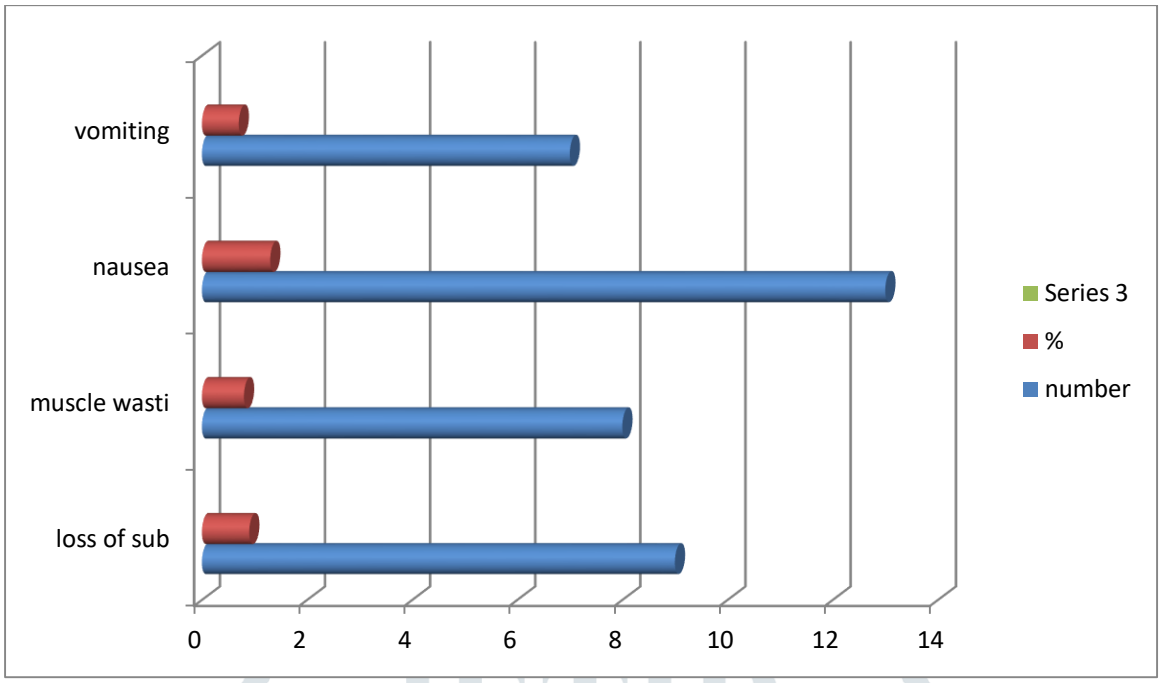
SUBJECTIVE DATA	STATUS	NUMBER	PERCENTAGE
Appetite	Normal	5	50%
	Decreased	15	150%
*Bowel	Normal	11	110%
	Constipated	8	80%
	Diarrhea	1	0%
Micturation	Normal	11	110%
	Polyuria	-	0%
	Oliguria	9	90%
Sleep	Normal	8	80%
	Lack of sleep	12	120%



Here , most of the people are undergoing with lack of appetite because of constipation, because the waste product that filled in the blood are not gets eliminated, due to the disturbance in GI functioning that leads to lack of sleep.

FUNCTIONAL IMPAIREMENT:

SYMPTOMS	NUMBER	PERCENTAGE
Loss of subcutaneous fat	9	90%
Muscle wasting	8	80%
Nausea	13	130%
Vomiting	7	70%



Protein-energy wasting, which involves loss of subcutaneous fat and muscle mass, is prevalent and is associated with mortality in hemodialysis patients, the associations of fat tissue and muscle mass indices with all-cause mortality in hemodialysis patients.

RESULTS AND DISCUSSION:

In this cross sectional study among 20 dialysis patients of both the genders, of different age groups, sex, their biochemical parameters , food frequency along with several co morbidities , all twenty of them are having high blood pressure along with anemia, followed by diabetes mellitus and cardiovascular diseases, remaining co morbidities like renal calculi, pyelonephritis, tuberculosis are seen in minute cases.

Hyper tension in renal patients is very common and it is the leading cause of kidney failure and it shows the higher risk in the age group of 41-50 years, it damages blood vessels in the kidneys reducing the ability to work properly and if blood vessels are damaged, they may stop removing wastes and extra fluid from the body., in some patients it is linked with presence of diabetes, hyper triglyceridaemia and proteinuria, hyper parathyroid is another cause of increase in blood pressure in dialysis patients with chronic kidney failure, calcification of arterial causes an increase in vascular resistance, causing increased pulse pressure.

Anemia it is caused due to low hemoglobin levels, it commonly occurs in kidney patients, it begins at the early stage of chronic renal failure it tends and worsen the kidney functions, immunosuppressant medicines can have side effects and particularly causes anemia, and also iron levels are low from losing blood.

SUMMARY AND CONCLUSION:

In this cross sectional study, we took 20 subjects of both the genders male and female. Of them 12 are male and 8 are female. It is associated more in men because of consumption of alcohol, high blood pressure due to stress and later prone to cardiovascular diseases. When kidneys filtration gets damaged, it can cause an increase in the urge to urinate. Sometimes this can also be a sign of urinary infection or enlarged prostate in men, and leads to uremia.

Men and female patients have different symptoms, men will have decreased libido and women patients will have irregular menstruation. The impaired kidneys cannot inactivate estrogen hormone and many men patients will become feminized and have the signs of female such as enlarged breast, reduced body hair etc. other complications includes cardio vascular problems, Anemia, proteinuria, hematuria.

Most of the patients assessed were above 41- 50 years of age. Once the body reaches physiologic maturity, the rate of catabolic changes become greater than the anabolic changes the resultant loss of the cells can lead to varying degrees of decreased efficiency and impaired function.

This is the major analysies among dialysis patients, which includes their several co morbidities for dialysis. Almost all are patients are having high blood pressure along with anemia and then diabetes mellitus as the immunosuppressant's having many side affects leads to anemic and patients iron levels are low from losing blood, increase

Among 40 patients, all are having elevated creatinine, urea and low hemoglobin levels. Elevated creatinine levels are the signs of impaired kidney functioning, the creatinine levels in the blood will rise due to poor clearance of creatinine by kidneys. The filtration process breaks down and so the glomeruli and tubules do no work as well. Toxins such as urea can start to buildup and cause problems. And most of them are anemic because the intake of iron is very less and kidneys are not making enough of a hormone called erythropoietin that helps our body to make red blood cells.

Of the patients with dialysis, the intake of dairy products and consumption of vegetables are very high. And the intake of the protein content is low as most of the patients are from vegetarian background and the remaining foods groups are taken in a moderate way.

Most of the people are undergoing with lack of appetite because of constipation, the waste product that filled in the blood are not gets eliminated, due to the disturbance in GI functioning that leads to lack of sleep. Some people even they are consuming all types of food groups, but their intake of quantity is less due to poor GI function, poor dietary habits and poverty as with increased intake of energy dense foods and limited fruits and vegetable intake fresh fruits and vegetables are often not readily available in low income communities and if available they are expensive compared to other foods.

Protein-energy wasting, which involves loss of subcutaneous fat and muscle mass, is prevalent and is associated with mortality in hemodialysis patients, the associations of fat tissue and muscle mass indices with all-cause mortality in hemodialysis patients. Patients can feel nauseous or experience vomiting for a number of reasons during and after dialysis treatment. These symptoms are commonly associated with kidney diseases. Sometimes nausea and vomiting causes disturbance to some patients to avoid further dialysis treatment.

ANNEXURE – 1

Name:

Age:

Gender:

Diagnosis:

Anthropometric measurements

Height:

Weight:

NUTRITIONAL SCREENING

GI SYMPTOMS	FUNCTIONAL IMPAIRMENT
Difficulty in chewing	Loss of subcutaneous fat
Difficulty in swallowing	Muscle wasting
Constipation	

Persistent Nausea

Persistent Vomiting

Diarrhoea

FOOD INTAKE

Appetite: Normal

Decreased

BIOCHEMICAL PARAMETERS

Haemoglobin	
Urea	
Creatinine	
Phosphorus	
Potassium	
Calcium	
RBS/FBS	
Sodium	

ANNEXURE –2

Since how long are you on dialysis?

Do you have any co-morbidities?

Do you have any of the symptoms?

- Anorexia
- Nausea
- Vomiting

Micturation Normal

Oliguria

Polyuria

EATING HABITS

Do you consume pulses?

- Daily
- Alternate days
- Weekly thrice

- Weekly once

Do you consume milk and milk products?

- Daily
- Alternate days
- Weekly thrice
- Weekly once

Do you consume non vegetarian foods?

- Daily
- Weekly 2-3 time
- Weekly once
- Monthly once

How often do you take green leafy vegetables?

- Daily
- Weekly 2-3 time
- Weekly once
- Monthly once

How often do you take fruits?

- Daily
- Weekly 2-3 time
- Weekly once
- Monthly once

How often do you consume vegetables?

- Daily
- Weekly 2-3 time
- Weekly once
- Monthly once

How many hours do you sleep?

- 5 hours
- 6-7 hours
- Lack of sleep

SUGGESTIONS:

- Dialysis patients need to limit their fluid intake to be healthy as possible. Too much fluid can raise blood pressure, damage the heart , cause swelling and make dialysis uncomfortable.
- Limit the amount of dietary sodium in the diet. Salt makes your body hold on water and limiting salt helps to control thirst.
- Physical activity is very essential for patients undergoing with dialysis, as it decreases the blood pressure, reduces peripheral vessel resistance.
- Limit the intake of alcohol consumption as further it causes the risk of cardiovascular diseases and alcohol abuse was associated with lower serum albumin levels
- Diuretics are not commonly used because of lack of efficacy. The choice of anti hypertensive depends upon the co morbidities .
- Treat hypertensive aggressively and keeps blood pressure healthy, and keep blood sugar levels in control and HbA^1 C of 7.
- Have regular checkups with doctor and include serum creatinine to measure GFR. Restore and maintain electrolyte balance
- Preserve residual renal function and compensate and spare protein losses,for tissue repair and synthesis replace lost amino acids without causing uremic symptoms
- Manage hyperphosphatemia in patients with renal insufficiency, which causes hypocalcaemia and hyperparathyroidism.

- Improve patient survival, reduce patient morbidity, increase efficiency of care and improve quality of life
- Counsel patient regarding managing a healthy diet to prevent or control heart diseases and diabetes.
- The first step in treating anemia, as it is c caused by iron, vit B ^{12}, or folic acid deficiencies to include sources of these nutrients in their diet. Some of these foods are high in sodium or phosphorous which people with CKD should limit in their diet.
- Before making any dietary changes, people with chronic renal failure should talk with a Dietician whose specializes in helping people with kidney diseases. A Dietician can help a person to plan healthy meals.
- Eat the right amount and right types of proteins to protect yours kidneys when the body uses proteins, it produces wastes. Kidneys remove these wastes, eating more protein than you need may make your kidneys work hardly.

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अनुवाद के क्षेत्र एवं आयाम

डॉ. अर्चना झा

भाषा एवं साहित्य संवाद और संप्रेषण की वजह से जीवंत होकर एक कंठ से दूसरे कंठ, एक समाज से दूसरे समाज में देश से लेकर विदेश तक प्रवाहमान हो उठे तब यह शाश्वत और अजर्रित है जो पुनरुत्पादन की संभावना से परिपूर्ण है। साहित्यकार अपनी ऊर्जा एवं चेतना के स्पर्श से मिथक, बिंब, प्रतीक, उपमानों के प्रयोग से संकेत को भी सांकेत, लालित्यपूर्ण भाषा का रूप प्रदान कर उसमें नवीन अर्थबोध, नवल सौंदर्य प्रवाहित करता है। साहित्य की भाषा केवल मस्तिष्क या प्रयोजन से नहीं बल्कि हृदय से जुड़ी होती है तभी तो वाल्मीकि एक सामान्य सी घटना को शब्दों का स्पर्श देते हैं और संपूर्ण काव्य प्रवाहमान हो उठता है। विद्यापति के शृंगारिक पद हों या कबीर का खंडन-मंडन या जयदेव की पदावली, वर्ड्सवर्थ, शैली, कीट्स या पंत का सृजन संसार या शेक्सपियर, प्रेमचंद, गोर्की या राहुल सांस्कृत्यायन या कालिदास का भावप्रवण ललित सौंदर्य हो ये सब प्रवाहमान होकर विभिन्न अर्थबोध, सौंदर्यबोध, चेतना को रचना में परिभाषित करते हुए भाषा की दीवार को तोड़ हृदय और मानस को छूते हैं तो 'अनुवाद' की आवश्यकता होती है।

अनुवाद वस्तुतः 'परकाया प्रदेश' की प्रक्रिया है, जिसमें हम दो चरणों से गुजरते हैं- एक तो उसके शाब्दिक अर्थ दूसरे उसके भाषिक संरचना में छिपे वैयक्तिक अर्थ से। हैंकोक के अनुसार अनुवाद का अर्थ दोविमुख होता है- प्रथमतः मूलार्थ का ठीक-ठाक अनुवाद दूसरे मूल की शैलीगत विशेषताओं को अनूदित सामग्री में उतारना। जिस तरह जीवन का प्रत्येक क्षण साहित्य है उसी प्रकार सृजन का प्रत्येक पल अनुवाद है। सृजन के दौरान हम जो कुछ सोचते हैं उसे शब्दों का रूप देते हैं। कई बार हमारी हृदयगत अनुभूति को मस्तिष्क उसी रूप में ढाल नहीं पाता है। यह 'स्वकाया प्रवेश' की प्रक्रिया है। अनुवाद की एक मूल आवश्यकता यह भी है कि मूल स्वरूप को पूरी तरह बदले नहीं। यह प्रयत्न लाघव न हो, अर्थ संकोच, अर्थ विस्तार, अर्थादेश, भावावेश और अर्थ की अस्पष्टता से मुक्त हो। क्योंकि 'अनुवाद कथनतः कथ्यतः निकटतम सहज प्रतिप्रतीकन की प्रक्रिया है।'

अनुवाद एक तरह से 'पुनःकथन' है, इस परिप्रेक्ष्य में जब हम इस पर विचार करते हैं तो पाते हैं कि भारतीय संस्कृति में गुरु शिष्य परंपरा है जहाँ शिष्य गुरु के वचनों को दुहराते थे यह 'अनुकथन' भी एक तरह का अनुवाद है। कबीर, जिन्हें निरक्षर माना गया है। उनके 'कथन' भी अनुकथन हैं। पौराणिक आख्यायन महाभारत में संजय भी पुनर्पाठ करते हैं। जिस घटना को वे अपनी आँखों से देखते हैं, उसे धृतराष्ट्र को सुनाते हैं। 'अनुवाद' वस्तुतः सामाजिक, सांस्कृतिक, साहित्यिक, ऐतिहासिक विरासत का आदान-प्रदान है। कालिदास के 'अभिज्ञान शांकुतलम' का अनुवाद अंग्रेजी में किया जाता है, वह जर्मन में भी अनुवादित होता है। रांगेय राघव शेक्सपियर के दस नाटकों का अनुवाद हिंदी में करते हैं। 'मर्चेंट ऑफ वेनिस' का अनुवाद 'वेनिस के

सौदागर' के रूप में होता है। भारत से गणित, ज्योतिष, आयुर्वेद के ज्ञान का अनुवाद अरब से होते हुए रोम तक पहुँचा। भारत में संस्कृत के धर्मग्रंथों का अनुवाद, वेद, उपनिषद एवं पौराणिक आख्यानों का अनुवाद भारत की लगभग सभी भाषाओं में हुआ है। विदेशों में भी जहाँ भारतीय भाषा अध्ययन केंद्र है। वहाँ प्रेमचंद, निराला, कबीर, तुलसी और सूर से लेकर पंतजलि, पाणिनी, कौटिल्य, राहुल सांस्कृत्यायन की कृति अनुवादित हैं, हमारे बौद्ध ग्रंथ जो पाली भाषा में थे उनका अनुवाद तिब्बती, चीनी आदि भाषाओं में हुआ। सर, विल्यिम जोंस ने संस्कृत के लिए एक नई भूमि तैयार की रॉयल एशियाटिक सोसायटी के रूप में। भाषिक अभिव्यक्ति, सृजन का यह संसार जितना प्रांजल और विस्तृत होता गया अनुवाद भी "एक भाषा में अभिव्यक्त विचारों या भावों को दूसरी भाषा में रूपांतरित करना भर नहीं रह गया। आज यह केवल भाषिक अनुवाद न रहकर भिन्न कालखंड संस्कृति, सभ्यता, साहित्य के परस्पर आदान-प्रदान का एक सेतु बन गया है जो सरहद, सांस्कृतिक सीमा से इतर एक संपर्क और संप्रेक्षण सेतु बन रहा है।"

अनुवाद एक तरह से 'एक्सरे' है जो कई सोपानों से गुजरता है-

पाठ → अध्ययन विश्लेषण - शिल्पगत/भावगत अभिव्यंजना बोध→ पुनः सृजन।

यह एक्सरे ध्वनि और उच्चारण के स्तर से होते हुए, लिपि रूप-स्तर पर विश्लेषित होता अर्थ स्तर पर विचारणीय बनकर प्रयुक्ति स्तर पर अभिव्यक्त होकर पुनः सृजित होता है।

आज के समय में अनुवाद केवल एक आवश्यकता ही नहीं 'अर्थोपार्जन' का एक साधन भी है। इस संदर्भ में जब अनुवाद के प्रकारों पर विचार करते हैं तो पाते हैं कि, अनुवाद के मूलतः दो रूप हैं-

1. साहित्यिक अनुवाद
2. साहित्येतर अनुवाद

अनुवाद का संबंध व्यक्ति और समाज से है। यही भाव, विचार की सृजनात्मक अभिव्यक्ति है जब साहित्यिक अनुवाद किया जाता है तो अनुवादक कृति की आत्मा को बसा लेता है। उसके बाह्य आकार, रूप के साथ-साथ अंतर से भी एकाकार होता है। फिर लक्ष्य भाषा में पुनर्रचना करता है।

मूल पाठ → विश्लेषण - भाव विचार →

एकात्मक → पुनःसृजन।

इसके तीन प्रमुख अंग है-

स्रोत भाषा → विषय → लक्ष्य भाषा

यह प्रक्रिया बोध और अभिव्यक्ति का मिश्रित है क्योंकि किसी भी कृति में हम 'रूप' को 'कथ्य' को अलग नहीं कर सकते। 'फिट्जगराल्ड' के अनुवाद शब्द-प्रतिशब्द नहीं होना चाहिए। अनुवादक अपनी रुचि के अनुसार अनूदित कृति के रूप में सृजन करना चाहिए। साहित्यिक अनुवाद में प्रांजलता एवं मूल कृति के साथ तादात्म्य होना साहित्य की भाषा सृजनात्मक होती है जो जीवन से संबद्ध है जहाँ यह गंध, स्पर्श, ध्वनि, चेतना होती है जो हमारी इंद्रिय को जगाकर भाव और जोड़ती है। ऐसे में 'काव्यानुवाद' में हम कई कठिनाईयों से जूझते हैं। क्योंकि अनुवाद में 'काव्य छंद, प्रतीक, बिंबविधान, स्पर्श, लय का अनुवाद कर पाते हैं। इसके लिए आवश्यक है 'पुनःसृजन' ध्यान दिया जाए। निराला की 'राम की शक्ति मुक्ति-बोध की 'ब्रह्मराक्षस', नरेश मेहता की 'की एक रात', मोहन राकेश की 'लहरों के राजहंस' सभी लालित्यपूर्ण काव्य नाटक हैं जिनका अनु असंभव नहीं पर मुश्किल है। तत्कालीन परिवेश 'साहित्येतर अनुवाद' का प्रयोग बढ़ा है।

1. राष्ट्रीय अंतरराष्ट्रीय स्तर पर वैचारिक आदान प्रदान के क्षेत्र में
2. वाणिज्य एवं बैंकिंग के क्षेत्र में
3. विज्ञान एवं टेक्नोलॉजी के क्षेत्र में

आज प्रत्येक राष्ट्र विज्ञान एवं टेक्नोलॉजी के में विकास कर रहा है परंतु अपने शोधकार्य अपनी में कर रहे हैं पर इसका अनुवाद अन्य भाषाओं में रहा है। अनुवाद द्वारा अन्य भाषा में जानकारी की जाती है।

धर्म- तत्कालीन परिवेश में विश्व की भाषाओं में धर्मग्रंथों का अनुवाद हो रहा है। मार्टिन ने बाइबिल का अनुवाद अरबी भाषा में किया। उपनिषदों का फारसी में अनुवाद किया गया।

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संचार माध्यम के क्षेत्र में- संचार के क्षेत्र में अनुवाद ने एक क्रांति ला दी है। अनुवाद एवं संचार के माध्यम से समाज-सभ्यता-संस्कृति आदि का अंतरण, आदान-प्रदान एक विशिष्ट प्रक्रिया में होने लगा है जो जन-जन तक पहुँच रहा है। हमारे देश में इंटरनेट, अखबार, पत्र-पत्रिकाएँ, टी.वी. सभी जनसंचार के विविध रूप हैं। इन सभी क्षेत्रों में अनुवाद की महत्ता सर्वोपरि है। प्रकाशक हो या संपादक या विज्ञापन की दुनिया हो किसी न किसी रूप में अनुवाद का सहारा लेना पड़ता है। हमारे देश में प्रेस ट्रस्ट ऑफ इंडिया द्वारा 'भाषा' नाम से तथा UNI द्वारा यूनिवार्ता के नाम से हिंदी समाचार का आदान-प्रदान अनुवाद का सहारा लेकर ही किया जाता हैं। बी. बी. सी, रायटर जैसी अंतराष्ट्रीय न्यूज एजेंसियाँ 'अनुवाद' के द्वारा ही अपनी सामग्री घर-घर तक पहुँचाती हैं।

इनसे इतर अंग्रेजी से हिंदी में कितनी फिल्में अनूदित (डबिंग) हो चुकी हैं। जनसंचार की तरह अनुवाद भी सर्वव्यापी है।

प्रशासन एवं न्यायालय में अनुवाद - वर्तमान व्यवस्था में प्रशासन एवं न्यायालय के क्षेत्र में अनुवाद की आवश्यकता सर्वविदित है क्योंकि भारत एक बहुभाषी विकासशील देश है। विश्व के प्रत्येक राष्ट्र और प्रदेशों के बीच 'संप्रेषण सेतु' का काम अनुवाद करता है। आज विश्व में कई व्यावसायिक और गैर व्यावसायिक संस्थाएँ वाणिज्य के क्षेत्र में अनुवाद का कार्य कर रही हैं। संयुक्त राष्ट्र संघ की संस्था यूनेस्को विश्व की भाषा अनुवाद का कार्य करती है। आजादी के बाद धीरे-धीरे अंग्रेजी के स्थानापन्न में हिंदी का प्रयोग हो रहा है। वर्तमान समय में अनुवाद एक ऐसा साधन बन गया है, जिसके जरिए जनता और प्रशासन के बीच एक संप्रेषण सौहादिपूर्ण बन रहा है।

सांस्कृतिक, कला एवं सभ्यता के क्षेत्र में अनुवाद- आज का परिवेश एक ग्लोबल विलेज के रूप में ढलता जा रहा है। संपूर्ण विश्व एक दूसरे की साहित्य, संस्कृतिक कला को जानने समझने का आग्रही है। यह आग्रह अनुवाद के सहारे परिपूर्ण किया जाता है। विश्व की प्राचीन सभ्यता और संस्कृति का आदान-प्रदान भी अनुवाद से ही संभव हो पाया। ग्रीक के बहुआयामी चिंतन को रोम ने अनुवाद के माध्यम से आत्मसात किया। ग्रीक महाकवि 'होमर' की रचना इलियट का अनुवाद जार्ज चापमैन ने किया। उमर खैयाम की रूबाइयों के अनुवाद ने तो धूम ही मचा दी। रवींद्र नाथ टैगोर ने कबीर के सौ पदों का अंग्रेजी अनुवाद कर कबीर के रहस्यवाद को योरोपीय देशों में फैलाया।

इन सबसे इतर साहित्येतर अनुवाद की भाषा एक आयामी, पारदर्शी होने के साथ-साथ अभिधात्मक होती है जिसका संबंध मस्तिष्क से है। अनुवाद के विभिन्न क्षेत्रों के अलावा प्रकृति के आधार पर अनुवाद के कई प्रकार हैं।

1. **शब्दानुवाद**- शब्दशः अनुवाद शब्दानुवाद कहलाता है, परंतु इस तरह के अनुवाद में अभिव्यक्ति और अर्थ के स्तर पर कई बार भ्रामक स्थिति उत्पन्न होती है। इसलिए आजकल यह प्रचलन में नहीं है साहित्यिक अनुवाद के क्षेत्रों में वैज्ञानिक एवं तकनीकी विषयों के अनुवाद में यह उपयोगी है।

भावानुवाद- इस तरह के अनुवाद में कृति में निहित भाव एवं विचार को आत्मसात कर अनुवाद किया जाता है। जिसमें कथ्य का प्रतिपाद्य संप्रेषित होता है उसकी संवेदना की भावाभिव्यंजना, सौंदर्य एवं लालित्य का अनुवाद नहीं हो पाता है। उदाहरण अगर हम 'उसने कहा था' कहानी का अनुवाद करते तो इसकी अंतरात्मा नष्ट होने की संभावना होगी।

व्याख्यानुवाद- धार्मिक पुस्तकों के अनुवाद में व्याख्यानुवाद की आवश्यकता होती है। काव्यशास्त्र, दर्शन, आयुर्वेद आदि ग्रंथों के भाष्य इसी के अंतर्गत लिखे जाते हैं। रामायण, महाभारत, पुराण, पंचतंत्र, चाणक्य नीति आदि के व्याख्यानुवाद हैं।

सारानुवाद- युगीन परिवेश में सारानुवाद का विशेष महत्व है क्योंकि संक्षिप्तता, सहजता, सरलता प्रामाणिकता इस तरह के अनुवाद के तत्व है। राजनैतिक बहस, वार्ता, साक्षात्कार, प्रतिवेदन के सार को अनुवादित किया जाता है। विधान मंडल की चर्चा, न्यायालय की बहस जिसमें कथ्य को पूर्णतः सुरक्षित कर अनुवाद किया जाता है।

विधा परिवर्तन- इस तरह के अनुवाद में कृतियों की विधा परिवर्तित कर अर्थात् उपन्यास को नाट्य रूप

में तथा कहानी नाटक उपन्यास आदि का आज सीरियल, फिल्म के रूप में परिवर्तन हो रहा है।

आशु अनुवाद- इस अनुवाद में दुभाषिए की आवश्यकता होती है जो राजनीतिज्ञ, खिलाड़ी वैज्ञानिक आदि के बीच संप्रेषण सेतु का कार्य करता है। आज के परिवेश में आशु अनुवादक तथा दुभाषिए का महत्व बढ़ता जा रहा है।

भाषा केवल संप्रेषण का साधन नहीं बल्कि समाज और राष्ट्र की अस्मिता है। भाषा का संरचनात्मक रूप, स्वरूप उसके प्रयोग के आधार पर बनता है।

बोली- विभाषा- राजभाषा/राष्ट्रभाषा

राजभाषा- यह तकनीकी रूप भारत के संविधान में सरकारी काम-काज के लिए प्रयोग किया गया। राजभाषा हमेशा प्रशासनिक कार्य-क्षेत्र से जुड़ी होती है। स्वंतत्रता के पश्चात् संघ की राजभाषा के रूप में देवनागरी में लिखित हिंदी भाषा को मान्यता मिली। 14 सितंबर 1949 को डॉ. राजेंद्र प्रसाद की अध्यक्षता में गठित समितिं के द्वारा राजभाषा का क्षेत्र विधि, न्याय, प्रशासन के अतिरिक्त वाणिज्य बैंक, रेलवे आदि जगहों पर भी है।

आचार्य देवेंद्र शर्मा के अनुसार-राजभाषा का प्रयोग मुख्यत: चार क्षेत्रों में अभिप्रेत है- शासन, विधि, न्यायपालिका और कार्यपालिका। इन चारों में जिस भाषा का प्रयोग हो उसे राजभाषा कहेंगे। राजभाषा का यही अभिप्राय और उपयोग है।

कार्यालयी साहित्य का अनुवाद मुख्यत: कार्यालयी अनुवाद है जो तकनीकी एवं सूचना प्रधान होता है। यहाँ अनुवादक तंत्र का एक अंग होता है इसलिए वह तटस्थ निर्वेयक्तिक होता है।

कार्यालयी अनुवाद की एक समस्या है कि पारिभाषिक शब्दावली में हिंदी के शब्द तो बन गए हैं। परंतु इन शब्दों के संदर्भ या परिभाषा कोश नहीं होने वजह से जटिल और दुरूह हो जाते हैं। आज आवश्यकता इस बात की है कि अनूदित सामग्री का मूल्यांकन किसी विशेषज्ञ के द्वारा हो।

कार्यालयी अनुवाद तकनीकी है जिसमें 'वाक्य संरचना' स्थापित होती है और पारिभाषिक शब्दावली शब्दों का प्रयोग किया जाता है। इसके हर शब्द 'अर्थ' एक विशेष प्रयोजन के लिए होता है।

युगीन परिवेश में अनुवाद केवल साध्य बल्कि साध्य और अर्थोपार्जन से लेकर सरहद को लांघते हुए संप्रेषण का सशक्त साधन बन गया है। यह साहित्य, संस्कृति, कला, शिक्षा, विज्ञान, राष्ट्रीय, अंतरराष्ट्रीय सरोकारों के आदान- प्रदान एक सशक्त माध्यम है जिसकी वजह से विश्व ग्लोबल समाज बन रहा है। ऐसे में अनुवादक दायित्व हो जाता है कि वस्तु निष्ठता, तथ्यात्मक प्रामाणिकता का ध्यान रखे, पक्षपात, दुराग्रह एवं बचे। भाषिक संरचना, शब्दावली अभिव्यंजना, लक्ष्य भाषा के अनुरूप हो एवं स्रोत भाषा के निकट हो। किसी विद्वान ने कहा है - "प्रत्येक भाषा का सांस्कृतिक परिवेश होता है जिसका निर्माण परंपरा नृतत्व विज्ञान एवं भौगोलिक, सामाजिक, पृष्ठभूमि से होता है।"

युगीन परिवेश में अनुवाद एक सहज रूप में जीवन के प्रत्येक आयाम से संपृक्त हो यही वजह है कि आज हिंदी भाषा केवल पठन-पाठन नहीं बल्कि कार्यालयों के सीमित निकलकर जनसंचार, उपभोक्तावादी संस्कृति विपणन से गुजरती, ज्ञान-विज्ञान की दुनिया बनाती, जनता से लेकर 'ब्यूरोक्रेट' तक की बन गई है ।

AN OBSERVATIONAL STUDY ON THE RELATION BETWEEN CHRONIC LIVER DISEASE AND IT'S PRIMARY COMPLICATION PORTAL HYPERTENSION

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ABSTRACT

Aim: An observational study on the relation between chronic liver disease and its primary complication portal hypertension.

Objectives:

- To estimate the incidence of chronic liver disease in hospital patients.
- To compare the ration of thecomplications of chronic liver disease (portal hypertension).
- To distinguish the etiologies of chronic liver disease (Alcoholic liver disease, non-alcoholic fatty liver disease).

Methods: The sample population (n=60) was chosen from one of the well reputed hospitals of Hyderabad.All the patients were of different age group, sex, socio-economic status with different co-morbidities.A format consisting of patient profile, anthropometric measurements, bio chemical data, clinical data, 24 hour dietary recall, dietary habits ,social habits and past medical history

Result &conclusion: Poor knowledge and practices regarding chronic liver disease in the community are important weaknesses. 75% of males and 25% of females suffer from chronic liver disease in which 40-60 age group suffers more with this life threatening disease (36.6%) followed by 20 to 40 age group[21.6%], greater than 60 age group[16.6%], infants[13.3%], less than 20 age group [11.6%] respectively. People having sedentary lifestyle were more in number [71.6%] followed by moderate [28.3%] with zero percentage of heavy lifestyle suffering with this disease. Percentage of overweight people were 28.3%, 23% were obese, 13.3% were healthy. Annual income for 50% patients was below 2 lakhs, chronic liver disease was found to be more in overweight people. The percentage of people consuming alcohol and are non – smoker was 36.6% and 16.6% were alcoholic and smoker. The co-morbidities associated with chronic liver disease was diabetes mellitus (75%), hypertension(58.3%), coronary artery disease(25%), hepatitis B (25%), hepatitis C (16.6%), chronic kidney disease(15%). Patients with ascites (83.3%), people with portal hypertension was (78.3%), followed by 60% of people suffered from esophageal varices, 43.3 % of people were having hepatic encephalopathy, 28.3% of people were having hepato renal syndrome. The data obtained shows us about the prevalence and the complications of chronic liver disease.

Key words: chronic liver diseases, its primary complications and portal hypertension.

INTRODUCTION

Liver is the metabolic capital of the body. It is the largest of the body's internal organs weighing about 1.1-1.5kgs in adulthood. It is cone shaped reddish brown consisting of two major lobes.It accomplishes multiple metabolic tasks through its vast specialized network of cells and circulating channel within each of its thousands of microscopic functional units [10].

- Functions:

The liver has many metabolic functions related to the three energy yielding macronutrients [carbohydrate,protein and fat]:

- Carbohydrate metabolism:

-Formation and storage of glycogen in glycogenesis.

-Conversion of amino acids residues to glucose in gluconeogenesis. [10]

- Protein metabolism:

-Deamination of amino acids.

-Urea formation for removal of ammonia from body fluids. [10]

- Fat metabolism:

-Formation of cholesterol and phospholipids.

-Formation of bile salts.

-Conversion of carbohydrate and protein intermediates to fat through lipogenesis. [10]

Chronic liver disease: In the clinical context a disease of the liver that involves a process of progressive destruction and regeneration of the liver cells which leads to fibrosis and cirrhosis is known as chronic liver disease. It is a persistent inflammatory condition of the liver in which the biochemical and histopatholigical abnormalities are present over a long period of time.

Non-alcoholic fatty liver disease, a common cause of chronic liver disease in adults, is incompletely characterized in children [42]. Hepatic and hepatobiliary diseases are a common cause of morbidity and mortality in children.[43]

- Etiology:

Non-alcoholic fatty liver disease [NAFLD]/non-alcoholic steatohepatitis[NASH]:

NAFLD is manifested with abnormal aminotransferases or incidental radiographic findings of fatty liver.It is associated with co-morbidities such as obesity,diabetes mellitus and dyslipidemia.

NASH is now a part of a spectrum of NAFLD,it occurs in individuals who do not consume excessive amount of alcohol.

Alcoholic liver disease: Alcohol has a direct toxic effect on liver.The ‘world health organization’ has identified more than 60% alcohol related diseases on consumption of ethanol. Alcohol has a direct action on lipid metabolism in liver by decreasing fatty acid oxidation, enhancing fatty acid synthesis, stimulation to triglyceride formation leading to fatty liver.

- Complications:

1. Portal hypertension
2. Ascites
3. Hypersplenism
4. Esophageal varices
5. Hypoalbuminaemia
6. Hepatopulmonary syndrome
7. Hepatorenal syndrome

- Risk factors :
    1. -Alcohol
    2. -Obesity
    3. -Blood borne viruses
    4. -Metabolic syndrome including raised blood lipids

Chronic liver disease (CLD) may be accompanied by portal hypertension (PHT)[4].Portal hypertension is most frequently associated with cirrhosis and is also associated with complications such as variceal bleeding, ascites or hepatic encephalopathy. As such, clinically significant portal hypertension forms the prelude to decompensation and impacts significantly on the prognosis of patients with liver cirrhosis [1].

❖ Prevention:

Current PHT treatment strategies orientate on the existence and characterization of esophageal varices, which strongly correlate with the hepatic venous pressure gradient (HVPG)—the gold standard for quantification of PHT. For prevention of variceal bleeding, oral non-selective beta blockers (NSBBs) are used, while, in acute bleeding situations, intravenous somatostatin, octreotide or terlipressin are available [1].

These drugs aim to decrease portal pressure; however, not all patients achieve a hemodynamic response, which is defined by a HVPG decrease >10% of baseline. Thus, current research intensively seeks new treatment options for PHT. Most experimental strategies aim at structural (liver fibrosis) and/or dynamic (endothelial dysfunction, hyper dynamic circulation) factors, which contribute to the severity of PHT [1].

The term "Portal Hypertension" (PHT) is to describe a condition characterized by increment in portal pressures, at least 5 mm of Hg above inferior vena cava (IVC) pressure, which was associated with portal circulatory structural changes and gastrointestinal bleeding [2]. Patients with chronic bleeding usually present with chronic iron deficiency anemia [3].

Although they are found in up to 70% of patients with PH [pulmonary hypertension] and are more common in patients with EV and PHG, they rarely cause bleeding [3]. The pathogenesis of portal hypertension is increasingly understood and emerging knowledge of the vascular processes that underpin portal hypertension has paved the way for exploring novel biomarkers of vascular injury, angiogenesis, and endothelial dysfunction [5].

In cirrhosis, PHT is initiated by an increase in intrahepatic vascular resistance (IHVR) and then exacerbated by changes in the systemic and splanchnic circulation that increase the portal inflow [6].

❖ Treatment/management :

Treatment should include non specific therapy such as blood volume replacement and antibiotic prophylaxis as well as specific treatment such as pharmacology therapy and endoscopy therapy.Trans jugular intrahepatic Porto systemic shunt [TIPS] through a jugular route connects the hepatic and portal vein in the liver to reduce portal pressure and thus prevent variceal bleeding [11].It is very important to know that there is treatment for CLD with PHT such as to include high protein food in the diet,do proper exercise,exclude oily food,junk food etc. instead include food which help in diminishing cirrhosis and hence decreasing the effect of PHT [7].

Try to exclude alcohol consumption as much as possible because alcohol is directly absorbed by the stomach lining and then passed to liver and other organs thereby it is very important to reduce the intake of alcoholic beverages [8].

It is very important to include protein in the diet because in many CLD with PHT cases there is a lot of albumin loss so hence in order to prevent this loss good amount of balanced diet should be included [9].

REVIEW OF LITERATURE

According to the global disease burden study, it is the 12th cause of death, the 17th cause of years of life-lost, and the 23rd cause of disability adjusted life year in the world [12, 13].

The total number of global deaths attributed to liver cirrhosis is increased from 777, 800 in 1990 to 1030,800 in 2010[12]

The natural history of liver cirrhosis Is largely influenced by the occurrence of variceal bleeding, ascites and infection. [14-17]

Child-Pugh score, model for end stage liver disease [MELD] score, and their components (i.e. bilirubin,albumin,prothrombin time or international normalized ratio, creatinine, encephalopathy, and ascites) are considered as the major predictors for the survival of liver cirrhosis [14-18]

The investigators found that the prophylactic anticoagulation could not only decrease the incidence of PVT, but also reduce the development of hepatic decompensation events and improve the survival. Recently it has been also proposed that the identification of thrombotic risk factors forPVT should be helpful to stratify the benefit of prophylactic anticoagulant in liver cirrhosis [19, 20]

Portal hypertension is a severe and frequent complication of chronic liver disease. The primary factor in the development of portal hypertension is a marked increase in hepatic vascular resistance to portal blood flow, which was classically attributed to distortion of liver architecture inherent to cirrhosis [21]

Hepatic venous pressure gradient [HVPG] has been shown to be an accurate prognosis index in patients in cirrhosis. In several reports liver stiffness proved as effective as Hepatic venous pressure gradient [HVPG] in predicting clinical decompensation and portal hypertension related complications in patients with chronic liver disease [22]

In patients with cirrhosis due to HBeAg-negative CHB, lamivudine mono-therapy reduces HVPG especially when virological suppression and biochemical remission is achieved.[23]

Non-cirrhotic portal hypertension has recently been reported as a liver complication in humanwho are found to be associated withexposure to didonosine with portal hypertensionwho initially presented with massive ascites and portal vein thrombosis. On reviewing the literature on didanosine-related non cirrhotic portal hypertension and analyzed the findings of 61 similar previously reported cases. [24]

Spleen stiffness and liver stiffness were more accurate than other non –invasive parameters in identifying patients with esophageal varices and degrees of portal hypertension .A linear model that included spleen stiffness and liver stiffness accurately predicted hepatic vein pressure gradient [HVPG] values. [25]

Portal hypertension is a surrogate of advanced liver disease. Reduction of portal pressure is the most efficient step to prevent intestinal bleeding and treat ascites. But this has a limited impact on survival. Interruption or modulation of inflammatory stimuli leading to liver damage and dysfunction of other organs is keyin order to prevent death or liver transplantation as ultimate rescue. [26]

Many questions remain with regards to the exact therapeutic parameters of beta-blockers in patients with cirrhosis in general, and in patients with refractory ascites in particular, and additional studies on the optimal timing and dosage of beta-blockers are certainly needed. Perhaps the most appropriate timing for beta-blocker therapy was outlined in the “window hypothesis” from Krag and colleagues which suggests that beta-blockers are beneficial only in a narrow clinical window in the course of cirrhosis. This dilemma will be resolved only by a prospective randomized controlled trial, but until that evidence becomes available, the Baveno VI Consensus Workshop provides practical clues to guide physicians’ decision about NSBB therapy in patients with decompensated cirrhosis. [27]

A survey in which stated that about 48% of people who consume alcohol on regular bases are prone to develop cirrhosis, and hence this is the emerging reason for mortality. [28]

Patients with portal hypertension are primarily directed at controlling complications such ascites, hepatic encephalopathy and gastric ulceration. In cases, in which these clinical syndromes are refractory to treatment, pharmacologic intervention to lower portal venous pressure may be indicated. [29]

Prolonged exposure to didanosineis one of the main risk factors for developing non-cirrhotic portal-hypertension. Since the therapeutic options are not yet clear, symptomatic treatment of portal hypertension and discontinuation of didanosine should be considered as the primary options for treatment. [30]

Ascites is initiated by portal hypertension through leakage of excessive lymph from a congested liver, causing effective plasma volume to contract and renal sodium retention to follow as a consequence of this contraction .an observation showed the rate of ascites formation does not increase falling paracentesis nor does the plasma volume fall, both of which should occur if traditional concept of ascites formation is correct. [31]

Ascites could be made to reform in a patient with cirrhosis by administering a sodium retaining hormone. This observation indicates that it is possible for ascites to form as a consequence of plasma volume expansion in cirrhosis [31]

For the cirrhotic patients undergoing surgical or interventional shunts, the overall mortality was not significantly associated with the presence of portal vein thrombosis in previous studies. The presence of portal vein thrombosis might be associated with the long term mortality in non liver transplant patients with liver cirrhosis, but not with short term mortality. [32]

Quality of life is variably impaired in cirrhosis. All domains of health related quality of life, exceptpain were altered in cirrhosis [9%-42%] mainly in younger patients. There were minor differences in relation to gender were as etiology had no effects [33]

It is reported that the impact of chronic hepatitis-C progresses to cirrhosis in about 20% of patients .interferon treatment leads to transient responses in about 40% of patients and apparent eradication of infection in 7% -40% of patients [34]

One hundred and four patients with primary biliary cirrhosis and primary sclerosing cholangitis participated ,of whom 73% were women , with an average age 55+/-12 years. Of these patients 61% had cirrhosis (37% child's A ,23%child's B & 2% child's C)[35]

Portal hypertension accounts for the majority of morbidity and mortality that is encountered in patients with cirrhosis .recent data suggests that intrahepatic angiogenesis and sinusoidal remodeling could also been involved in sinusoidal resistance ,fibrosis and portal hypertension .[36,37]

METHODOLOGY

Description: The present study was conducted among 60 patients in a multi-specialtyhospital. A structured questionnaire was administered along with 24 hour dietary recall.

Participants: An observational study was done on 60 patients were various etiological factors were taken under consideration, patientprofile, anthropometricmeasurements, bio chemical data, clinical data,24 hour dietary recall, eatinghabits, social habits and past medical history.

Material and methods: A questionnaire was designed for 60 patients were different parameters were taken into account.

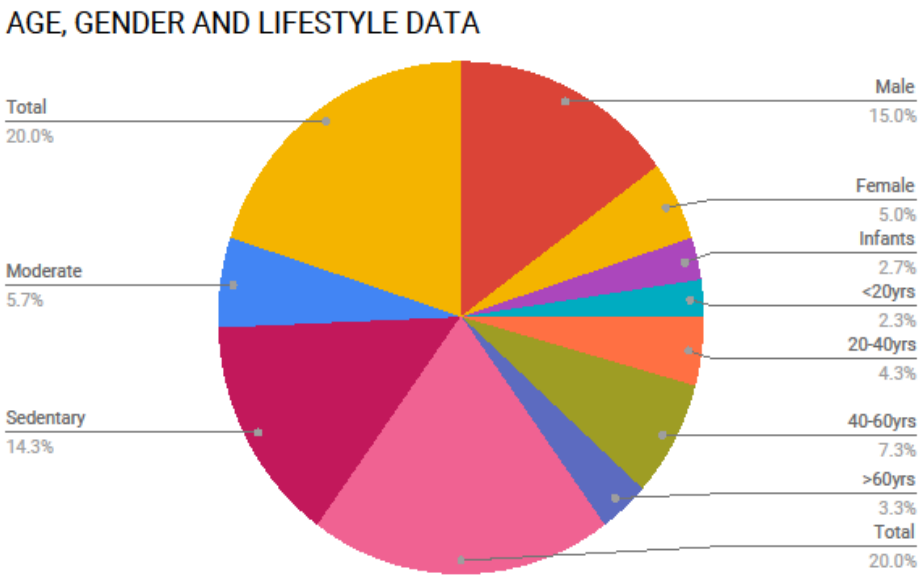
Firstly a one on one interaction was done with the patient were he/she was asked to tell the entire history of the disease outcome.

Secondly out of the above details the questionnaire was filled. Later on data analysis was done.

RESULTS AND DISCUSSION

Table 1:Socio economic profile of the respondents

Gender of respondents	Frequency number	Percentage
Male	45	75%
Female	15	25%
Age of respondents		
Infants	8	13.3%
<20	7	11.6%
20-40	13	21.6%
40-60	22	36.6%
>60	10	16.6%
Total	60	100%
Lifestyle		
Sedentary	43	71.6%
Moderate	17	28.3%
Heavy	0	0%
Total	60	100%

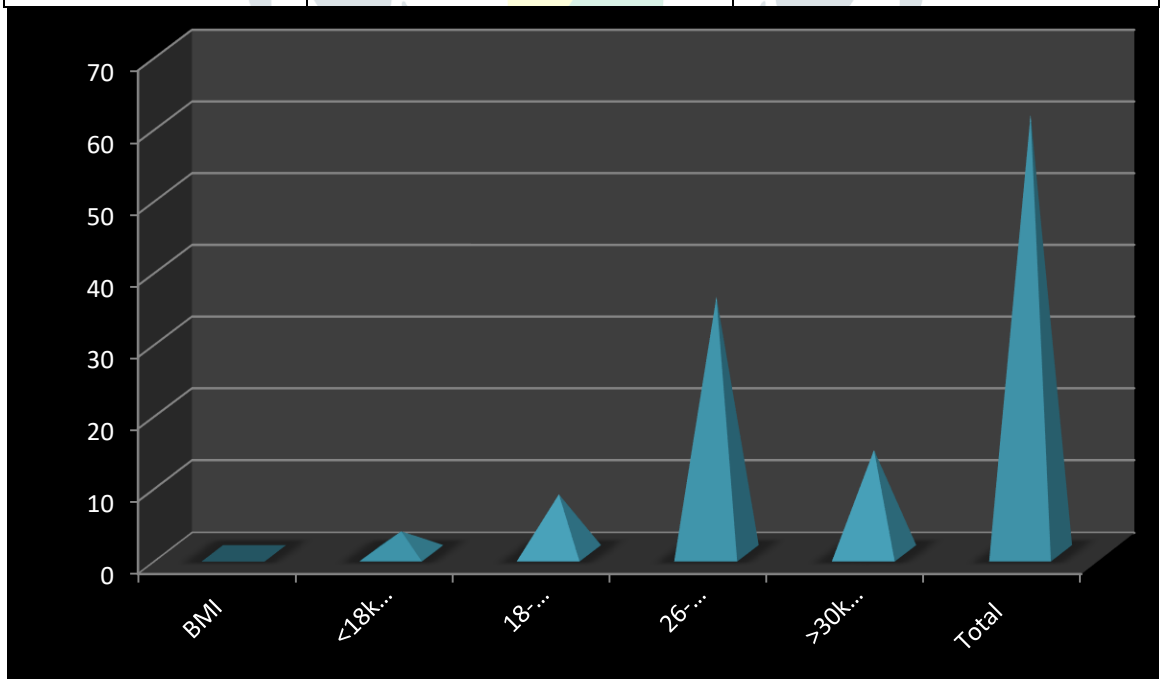


Total sample size of this study was 60 respondents out of total 60 respondents, 45(75%) were male and 15(25%) were female.

Lifestyle modifications leading to weight reduction and/or increased physical activity consistently reduced liver fat and improve glucose control/insulin sensitivity.Limited data also suggest that lifestyle interventions may hold benefits for histopathology. (41)

Table 2: Body mass index data

BMI	Frequency	Percentage
<18kgs/m2	3	5%
18-25kgs/m2	8	13.3%
26-30kgs/m2	35	58.3%
>30kgs/m2	14	23.3%
Total	60	100%

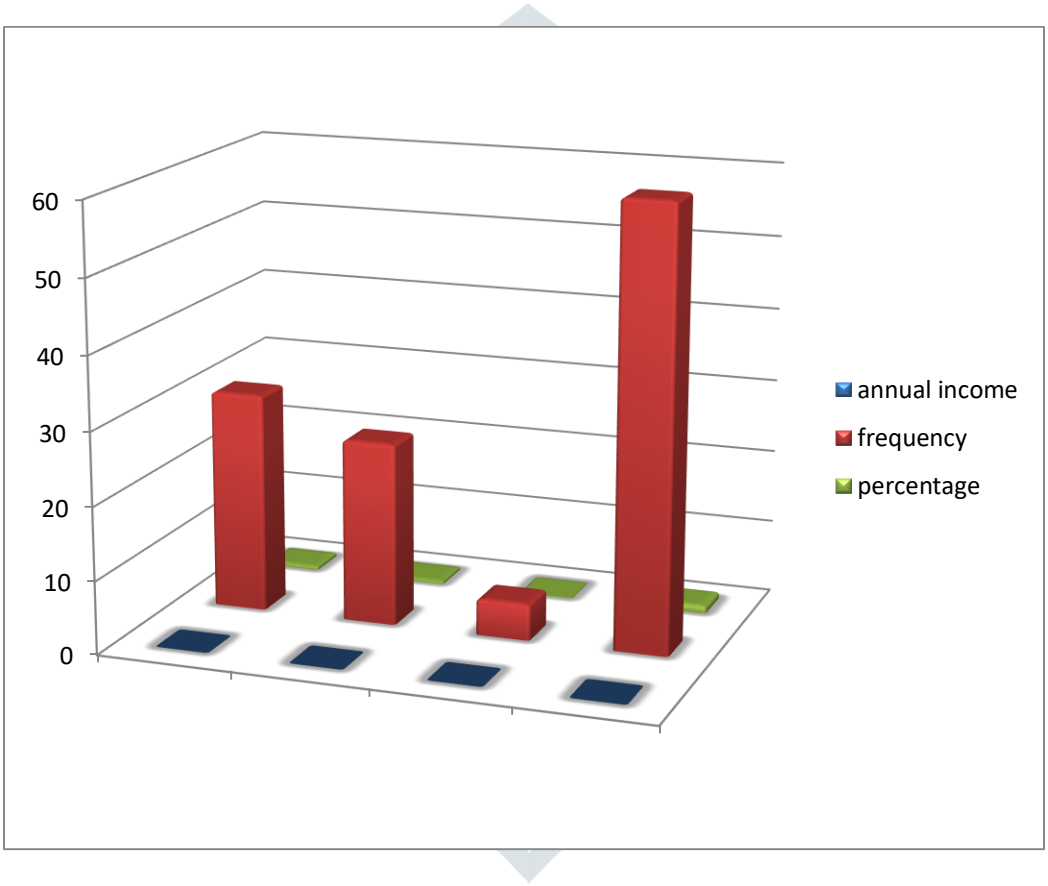


Out of 60 respondents 58% of the people were overweight, 23% were obese, 13.3% were healthy and 5% were underweight which shows that most of the CLD cases were present in overweight people.

Fifty eight of eighteen patients enrolled had varying degrees of non-alcoholic steatohepatitis, of these 26 had fibrosis and 8 had silent cirrhosis. The association of metabolic syndrome, female-sex, a long history of obesity and body mass index>45 were considered to be independent risk-factors for fibrosis. (40)

Table 3: Annual income data

Annual income	Frequency	Percentage
< 2 lakhs	30	50%
2-6 lakhs	25	41.6%
>6 lakhs	5	8.3%
TOTAL	60	100%

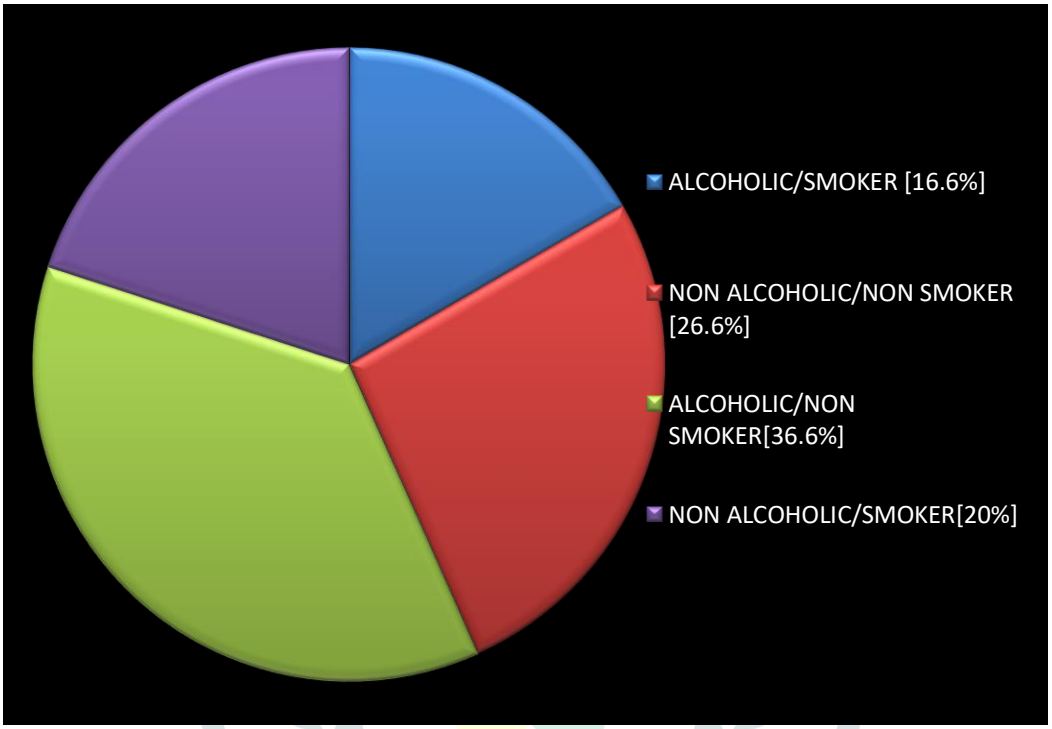


Out of 60 respondents 50% people annual income is below 2 lakhs, above 41.6 % people annual income between 2-6 lakhs , and about 8.3 % people annual income is greater than 6 lakhs .

According to National health interview survey 2017 about 792 people who were poor suffered from cld and about 809 nearly poor people also suffered from cld and about 2677 people who were rich suffered the most due to unhealthy social habits.[41]

Table 4: Social habits data

Social habits	Frequency	Percentage
Alcoholic / Smoker	10	16.6%
Non alcoholic / Non smoker	16	26.6%
Alcoholic / Non smoker	22	36.6%
Non alcoholic /Smoker	12	20%

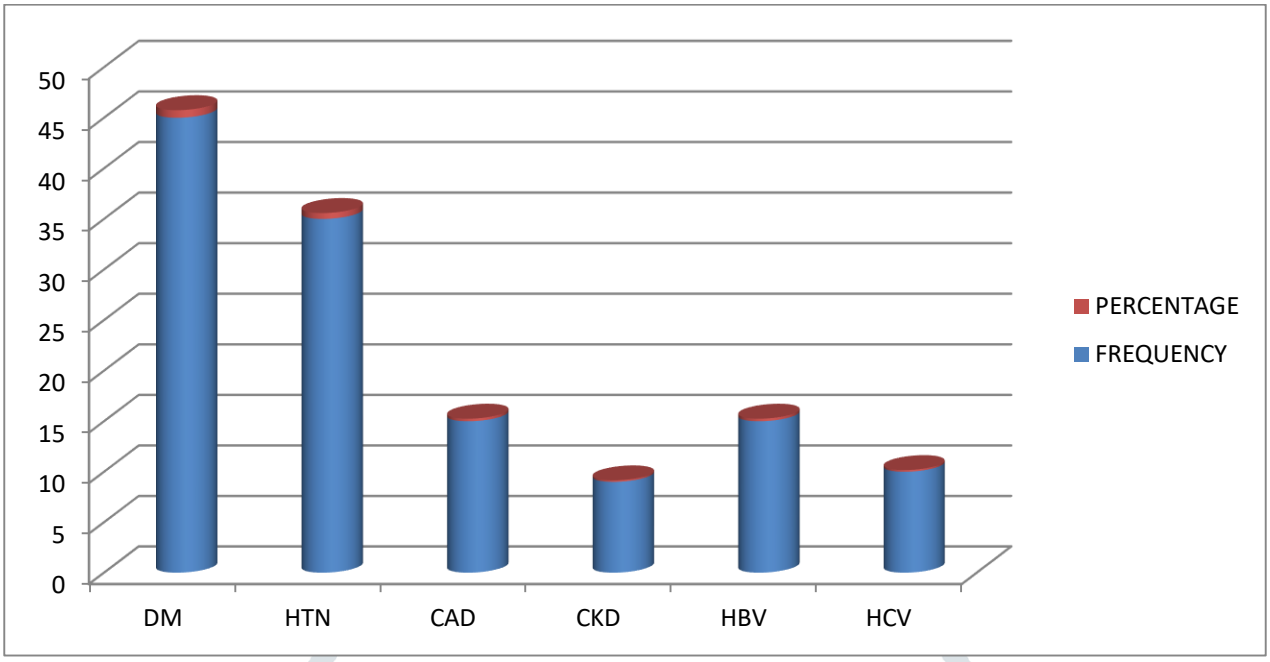


Out of 60respondents, 36.6% were alcoholic and non-smoker, 26.6% were non-alcoholic non-smoker, 20% were non-alcoholic smoker and 16.6% were alcoholic and smoker.

The prevalence rates for chronic liver disease were 11.78% (1998-1994), 15.66% (1999-2004), and 14.78 %(2005-2008).During the same period, alcoholic liver disease (1.38%, 2.21% and 2.05%) remain generally stable. In contrast, the prevalence of non alcoholic fatty liver disease increases from 5.51% to 9.84% to 11.0%. [42]

Table 5:Past medical history data

Diabetes mellitus	Hypertension	Coronary artery disease	Chronic kidney disease	Hepatitis b	Hepatitis c
45[75%]	35[58.3%]	15[25%]	9[15%]	15[25%]	10[16.6%]

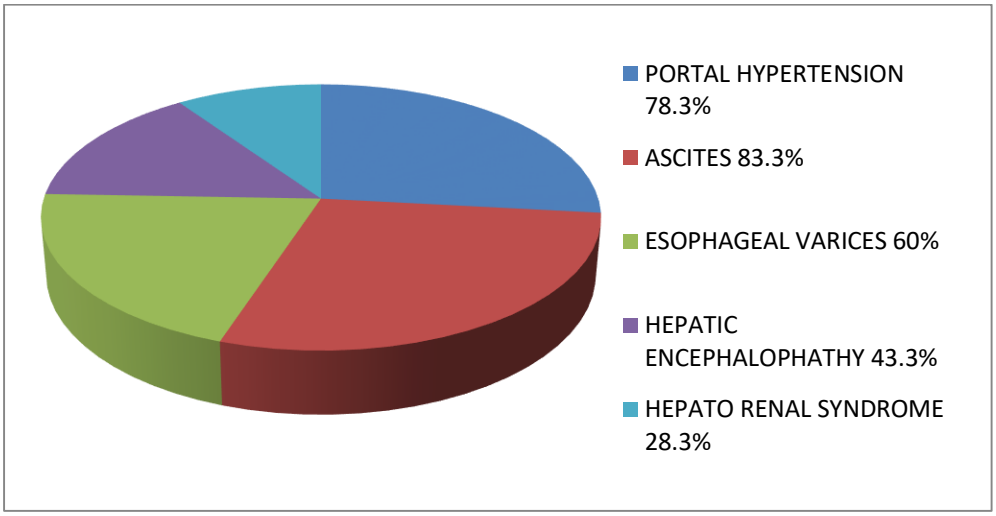


Out of the study 75% of people were having diabetes mellitus, 58.3 % of people were having hypertension, 25% of people were having coronary artery disease, 25% of people were having hepatitis B, 16.6 % of people were having hepatitis C,and 15% of people were having chronic kidney disease.

The prevalence of hepatitis B virus is 0.36%, 0.33%, 0.34% whereas the prevalence of hepatitis C is 1.95%, 1.97% , 1.68%,diabetes mellitus is 5.55%, 7.88%, and 9.11%,hypertension is 22.68%, 33.11%, 34.08% [44].

Table 6: Complications of chronic liver disease

Complication	Frequency	Percentage
Portal hypertension	47	78.3%
Ascites	50	83.3%
Esophageal varices	36	60%
Hepatic encephalopathy	26	43.3%
Hepato renal syndrome	17	28.3%



Out of the study 83.3% of people were having ascites,78.3% of people were having portal hypertension,60% of people were having esophageal varices,43.3% of people were having hepatic encephalopathy and 28.3% of people were having complication of hepato renal syndrome.

Sinusoidal intrahepatic portal hypertension most often is the result of fibrotic hepatopathies[45,46].Concurrent hypoalbuminemia secondary to hepatic synthetic failure lowers vascular colloid osmotic pressure that further aggravate ascites formation[47].In humans the hepatic renal syndrome is always accompanied by a state of refractory ascites and end stage liver failure[48,49].

Global study on figures of portal vein thrombosis [38]

First author [year]	Country	Number of total patients	Portal vein thrombosis number (%)
Amitrano (2012)	Italy	185	32 (17%)
Attili(2012)	Italy	129	25(19%)
Chen(2012)	Taiwan	101	25(25%)
D'Amico (2003)	Italy	291	37(13%)
Doumit (2009)	Canada	398	44(11%)
Hung(2012)	Taiwan	95	13(14%)
Lee (2012)	Taiwan	97	19(20%)

International incidence of chronic liver disease [39]

Frequency in 1000's:

Total number of liver disease	4497
Male	2261
Female	2236
18-44yrs	1247
45-64yrs	2258
65-74yrs	704
75 and 0ver	288
Total number of morbidity rate=4.5million Total number of mortality rate=40,545	

RECOMMENDATIONS

Chronic liver disease is a major public health problem throughout the world affecting hundreds of millions of people. It is a cause of considerable illness and death in human population from the acute infection or its effects, which may include chronic acute hepatitis, cirrhosis and primary liver cancer.

Avoiding alcohol after getting diagnosed with chronic liver disease helps reducing its complications.

Fatty changes in the liver are common whenever there is a high proportion of fat in the metabolic mixture, for example in uncontrolled diabetes , in starvation ,in some cases of obesity and when too much carbohydrate has been infused during intravenous feeding .

Modern dietary management of chronic liver disease essentially involves modification of the quality and quantity of food to be taken by the liver patients .the following guidelines are applicable to chronic liver disease irrespective of type, weight status, age, gender or occupation.

Dietary management in chronic liver disease

- Energy: consumption of food is difficult because of anorexia and ascites. The patient are usually emaciated by the time cirrhosis of the liver is diagnosed .the patient requires highly nutritious food i.e. high calorie diet is necessary for prolonged undernourishment.
- Protein: The serum albumin which is exclusively synthesized by the liver cells , is low in cirrhosis and aggravated by the loss of considerable amount of albumin into ascitic fluid
- Fats: even if fatty changes are present in the liver, fat should be given provided adequate amounts of proteins
- Salt restricted diet advised 0 gm
- Wide variety of cereals can be included liberally in their refined form
- Pulses to be included daily. cooked form is better tolerated
- Double toned milk and their products are preferred
- Cooking oil about 3 teaspoons per day inclusive of ghee, butter
- Whole fruit to be preferred , avoid fruit juices

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CASE STUDY FORMAT

I. NUTRITIONAL ASSESSMENT

1. Patient profile:
   a. Patients name-
   b. Age-
   c. Sex-
   d. Life style-
   e. Date of admission-
   f. Date of discharge-
2. Anthropometric measurement:
   a. Height-
   b. Weight-
   c. BMI-
   d. IBW-
   e. DBW-
      - Assessment: (modified MUST tool is used for assessment)

Nutritional screening:-

Patient has been identified to be at minimal risk and does not need further assessment.
Patient has been at nutritional risk and must undergo detailed nutritional assessment.

Nutritional Risk Factor:

- ○ Inadequate PO intake
- ○ Chewing/swallowing problem
- ○ Significant weight loss
- ○ Mouth ulcer
- ○ Poor skin integrity
- ○ Abnormal lab values
- ○ Dxof GI tract
- ○ Increased nutritional need
- ○ Nausea/vomiting
- ○ Other

Short term goals/recommendations:

- ○ Loose/gain weight
- ○ Maintain present nutritional status
- ○ To improve nutritional status
- ○ Maintain blood sugars within limit
- ○ Increase physical activity

3. Biochemical data:
   a. Diagnosis-
   b. Investigations-

4.Clinical data:

   a. Present complaint-
   b. Past medical history-
   c. Family history-
   d. Medications-

   e. Treatment/plan-

4. Dietary history(24hrs recall-

QUESTIONNAIRE TO ELICIT THE INFORMATION ON CHRONIC

LIVER DISEASE WITH PORTAL HYPERTENSION

General information:

1. Name:

2. Age and gender:

3. Marital status:

4. Profession:

5. Lifestyle:

(A) Sedentary (b) moderate(c) heavy

6. What is your annual income?

(a) BelowRs.2lakhs (b) Rs.2lakhs-4lakhs (c) Rs.4lakhs-6lakhs (d)> 6l

Anthropometric measurements:

1. Height:

2. Weight:

3. BMI:

4. IBW:

5. Dry body weight:

Socio economic data:

1. Family type:

a. Nuclear ( ) b. Joint ( ) c. Single ( )

2. Total number of family members: 1, 2, 3, 4 or more ( )

Eating habits:

1. How is your appetite?

(a) good

(b) Fair

(c) Poor

2. What is your food choice?

(a) Vegetarian

(b) Non vegetarian

(c) Jain

3. What is your bowel moment frequency?

(a) Once

(b) Twice

(c) Thrice

4. What is your total oil consumption per month per head?

(a) 1-2lt

(b) 3-4lt

(c) >5lt.

5. What is your salt consumption per day?

(a) 1tsp

(b) 1 ½ tsp

(c) 2tsp or more

6. What is your fruit consumption per day?

(a) Everyday

(b) Twice

(c) Thrice

7. What is your number of meals per day?

1( ) 2( ) 3 or more ( )

8. What is your fluid intake per day?

(a)1-2lt (b) 3-4lt(c)>5lt

9. Do you have any food allergies?

If YES then _____NO ( )

10. Do you consume any?

(a) Bakery products like (bread, pastries, biscuits etc.)

(b) Savoury products like (pickles, papads etc.)

(c) None of the above

11. Do you consume junk food in a week [yes/no?]

a) Onceb) twice c) more than two days

12. Do you consume fatty products like [yes/no?]

a) Ghee b) butter c) cream d) any other_____

Social habits:

(a)Smoking (b) alcoholic(c) tobaccochewing (d) anyother (e) none

13. How many numbers of cigarettes do you consume per day?

(a)2 (b)3 (c)more than 3

Physical activity:

1. Do you do physical activity [yes/no], if yes then how much then how much time do you spend

(a)1 ½ hr. (b)1hr (c)more than 1hr

2. What are your sleeping habits/no. of hours you sleep (a) 2-4hrs (b) 5-6hrs (c) 6-8hrs

3. Do you had any weight loss or weight gain if yes then

(Intentional or unintentional)

Medical history:

1. Do you have any past medical history?

(DM, HTN, CLD, CKD, ANY OTHER_____)

2. Do you consume any supplements like [yes/no?]

(a)Vitamin d (b) iron (c) multivitamins

If yes then since from how long_____

3. Do you consume any herbal medicine yes/no if yes then_____

4. Are you consuming any ayurvedic or herbal medicine (if yes_____/no?)

5. Do you had any GI complications (yes____/no)

6. Do you have any family history of?

Diabetes mellitus (), Hypertension () Coronary artery disease ( ) Hepatitis b ( ) or any other_____

7. Do you have any past surgical history (if yes_____/no?)

IS LIFE WORTH LIVING? IT ALL DEPENDS ON LIVER!!

AN OBSERVATIONAL STUDY ON THE RELATION BETWEEN CHRONIC LIVER DISEASE AND IT'S PRIMARY COMPLICATION PORTAL HYPERTENSION

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ABSTRACT

Aim: An observational study on the relation between chronic liver disease and its primary complication portal hypertension.

Objectives:

- To estimate the incidence of chronic liver disease in hospital patients.
- To compare the ration of thecomplications of chronic liver disease (portal hypertension).
- To distinguish the etiologies of chronic liver disease (Alcoholic liver disease, non-alcoholic fatty liver disease).

Methods: The sample population (n=60) was chosen from one of the well reputed hospitals of Hyderabad.All the patients were of different age group, sex, socio-economic status with different co-morbidities.A format consisting of patient profile, anthropometric measurements, bio chemical data, clinical data, 24 hour dietary recall, dietary habits ,social habits and past medical history

Result &conclusion: Poor knowledge and practices regarding chronic liver disease in the community are important weaknesses. 75% of males and 25% of females suffer from chronic liver disease in which 40-60 age group suffers more with this life threatening disease (36.6%) followed by 20 to 40 age group[21.6%], greater than 60 age group[16.6%], infants[13.3%], less than 20 age group [11.6%] respectively. People having sedentary lifestyle were more in number [71.6%] followed by moderate [28.3%] with zero percentage of heavy lifestyle suffering with this disease. Percentage of overweight people were 28.3%, 23% were obese, 13.3% were healthy. Annual income for 50% patients was below 2 lakhs, chronic liver disease was found to be more in overweight people. The percentage of people consuming alcohol and are non – smoker was 36.6% and 16.6% were alcoholic and smoker. The co-morbidities associated with chronic liver disease was diabetes mellitus (75%), hypertension(58.3%), coronary artery disease(25%), hepatitis B (25%), hepatitis C (16.6%), chronic kidney disease(15%). Patients with ascites (83.3%), people with portal hypertension was (78.3%), followed by 60% of people suffered from esophageal varices, 43.3 % of people were having hepatic encephalopathy, 28.3% of people were having hepato renal syndrome. The data obtained shows us about the prevalence and the complications of chronic liver disease.

Key words: chronic liver diseases, its primary complications and portal hypertension.

INTRODUCTION

Liver is the metabolic capital of the body. It is the largest of the body's internal organs weighing about 1.1-1.5kgs in adulthood. It is cone shaped reddish brown consisting of two major lobes.It accomplishes multiple metabolic tasks through its vast specialized network of cells and circulating channel within each of its thousands of microscopic functional units [10].

- Functions:

The liver has many metabolic functions related to the three energy yielding macronutrients [carbohydrate,protein and fat]:

- Carbohydrate metabolism:

-Formation and storage of glycogen in glycogenesis.

-Conversion of amino acids residues to glucose in gluconeogenesis. [10]

- Protein metabolism:

-Deamination of amino acids.

-Urea formation for removal of ammonia from body fluids. [10]

- Fat metabolism:

-Formation of cholesterol and phospholipids.

-Formation of bile salts.

-Conversion of carbohydrate and protein intermediates to fat through lipogenesis. [10]

Chronic liver disease: In the clinical context a disease of the liver that involves a process of progressive destruction and regeneration of the liver cells which leads to fibrosis and cirrhosis is known as chronic liver disease. It is a persistent inflammatory condition of the liver in which the biochemical and histopatholigical abnormalities are present over a long period of time.

Non-alcoholic fatty liver disease, a common cause of chronic liver disease in adults, is incompletely characterized in children [42]. Hepatic and hepatobiliary diseases are a common cause of morbidity and mortality in children.[43]

- Etiology:

Non-alcoholic fatty liver disease [NAFLD]/non-alcoholic steatohepatitis[NASH]:

NAFLD is manifested with abnormal aminotransferases or incidental radiographic findings of fatty liver.It is associated with co-morbidities such as obesity,diabetes mellitus and dyslipidemia.

NASH is now a part of a spectrum of NAFLD,it occurs in individuals who do not consume excessive amount of alcohol.

Alcoholic liver disease: Alcohol has a direct toxic effect on liver.The ‘world health organization’ has identified more than 60% alcohol related diseases on consumption of ethanol. Alcohol has a direct action on lipid metabolism in liver by decreasing fatty acid oxidation, enhancing fatty acid synthesis, stimulation to triglyceride formation leading to fatty liver.

- Complications:

1. Portal hypertension
2. Ascites
3. Hypersplenism
4. Esophageal varices
5. Hypoalbuminaemia
6. Hepatopulmonary syndrome
7. Hepatorenal syndrome

- Risk factors :
    1. -Alcohol
    2. -Obesity
    3. -Blood borne viruses
    4. -Metabolic syndrome including raised blood lipids

Chronic liver disease (CLD) may be accompanied by portal hypertension (PHT)[4].Portal hypertension is most frequently associated with cirrhosis and is also associated with complications such as variceal bleeding, ascites or hepatic encephalopathy. As such, clinically significant portal hypertension forms the prelude to decompensation and impacts significantly on the prognosis of patients with liver cirrhosis [1].

❖ Prevention:

Current PHT treatment strategies orientate on the existence and characterization of esophageal varices, which strongly correlate with the hepatic venous pressure gradient (HVPG)—the gold standard for quantification of PHT. For prevention of variceal bleeding, oral non-selective beta blockers (NSBBs) are used, while, in acute bleeding situations, intravenous somatostatin, octreotide or terlipressin are available [1].

These drugs aim to decrease portal pressure; however, not all patients achieve a hemodynamic response, which is defined by a HVPG decrease >10% of baseline. Thus, current research intensively seeks new treatment options for PHT. Most experimental strategies aim at structural (liver fibrosis) and/or dynamic (endothelial dysfunction, hyper dynamic circulation) factors, which contribute to the severity of PHT [1].

The term "Portal Hypertension" (PHT) is to describe a condition characterized by increment in portal pressures, at least 5 mm of Hg above inferior vena cava (IVC) pressure, which was associated with portal circulatory structural changes and gastrointestinal bleeding [2]. Patients with chronic bleeding usually present with chronic iron deficiency anemia [3].

Although they are found in up to 70% of patients with PH [pulmonary hypertension] and are more common in patients with EV and PHG, they rarely cause bleeding [3]. The pathogenesis of portal hypertension is increasingly understood and emerging knowledge of the vascular processes that underpin portal hypertension has paved the way for exploring novel biomarkers of vascular injury, angiogenesis, and endothelial dysfunction [5].

In cirrhosis, PHT is initiated by an increase in intrahepatic vascular resistance (IHVR) and then exacerbated by changes in the systemic and splanchnic circulation that increase the portal inflow [6].

❖ Treatment/management :

Treatment should include non specific therapy such as blood volume replacement and antibiotic prophylaxis as well as specific treatment such as pharmacology therapy and endoscopy therapy.Trans jugular intrahepatic Porto systemic shunt [TIPS] through a jugular route connects the hepatic and portal vein in the liver to reduce portal pressure and thus prevent variceal bleeding [11].It is very important to know that there is treatment for CLD with PHT such as to include high protein food in the diet,do proper exercise,exclude oily food,junk food etc. instead include food which help in diminishing cirrhosis and hence decreasing the effect of PHT [7].

Try to exclude alcohol consumption as much as possible because alcohol is directly absorbed by the stomach lining and then passed to liver and other organs thereby it is very important to reduce the intake of alcoholic beverages [8].

It is very important to include protein in the diet because in many CLD with PHT cases there is a lot of albumin loss so hence in order to prevent this loss good amount of balanced diet should be included [9].

REVIEW OF LITERATURE

According to the global disease burden study, it is the 12th cause of death, the 17th cause of years of life-lost, and the 23rd cause of disability adjusted life year in the world [12, 13].

The total number of global deaths attributed to liver cirrhosis is increased from 777, 800 in 1990 to 1030,800 in 2010[12]

The natural history of liver cirrhosis Is largely influenced by the occurrence of variceal bleeding, ascites and infection. [14-17]

Child-Pugh score, model for end stage liver disease [MELD] score, and their components (i.e. bilirubin,albumin,prothrombin time or international normalized ratio, creatinine, encephalopathy, and ascites) are considered as the major predictors for the survival of liver cirrhosis [14-18]

The investigators found that the prophylactic anticoagulation could not only decrease the incidence of PVT, but also reduce the development of hepatic decompensation events and improve the survival. Recently it has been also proposed that the identification of thrombotic risk factors forPVT should be helpful to stratify the benefit of prophylactic anticoagulant in liver cirrhosis [19, 20]

Portal hypertension is a severe and frequent complication of chronic liver disease. The primary factor in the development of portal hypertension is a marked increase in hepatic vascular resistance to portal blood flow, which was classically attributed to distortion of liver architecture inherent to cirrhosis [21]

Hepatic venous pressure gradient [HVPG] has been shown to be an accurate prognosis index in patients in cirrhosis. In several reports liver stiffness proved as effective as Hepatic venous pressure gradient [HVPG] in predicting clinical decompensation and portal hypertension related complications in patients with chronic liver disease [22]

In patients with cirrhosis due to HBeAg-negative CHB, lamivudine mono-therapy reduces HVPG especially when virological suppression and biochemical remission is achieved.[23]

Non-cirrhotic portal hypertension has recently been reported as a liver complication in humanwho are found to be associated withexposure to didonosine with portal hypertensionwho initially presented with massive ascites and portal vein thrombosis. On reviewing the literature on didanosine-related non cirrhotic portal hypertension and analyzed the findings of 61 similar previously reported cases. [24]

Spleen stiffness and liver stiffness were more accurate than other non –invasive parameters in identifying patients with esophageal varices and degrees of portal hypertension .A linear model that included spleen stiffness and liver stiffness accurately predicted hepatic vein pressure gradient [HVPG] values. [25]

Portal hypertension is a surrogate of advanced liver disease. Reduction of portal pressure is the most efficient step to prevent intestinal bleeding and treat ascites. But this has a limited impact on survival. Interruption or modulation of inflammatory stimuli leading to liver damage and dysfunction of other organs is keyin order to prevent death or liver transplantation as ultimate rescue. [26]

Many questions remain with regards to the exact therapeutic parameters of beta-blockers in patients with cirrhosis in general, and in patients with refractory ascites in particular, and additional studies on the optimal timing and dosage of beta-blockers are certainly needed. Perhaps the most appropriate timing for beta-blocker therapy was outlined in the “window hypothesis” from Krag and colleagues which suggests that beta-blockers are beneficial only in a narrow clinical window in the course of cirrhosis. This dilemma will be resolved only by a prospective randomized controlled trial, but until that evidence becomes available, the Baveno VI Consensus Workshop provides practical clues to guide physicians’ decision about NSBB therapy in patients with decompensated cirrhosis. [27]

A survey in which stated that about 48% of people who consume alcohol on regular bases are prone to develop cirrhosis, and hence this is the emerging reason for mortality. [28]

Patients with portal hypertension are primarily directed at controlling complications such ascites, hepatic encephalopathy and gastric ulceration. In cases, in which these clinical syndromes are refractory to treatment, pharmacologic intervention to lower portal venous pressure may be indicated. [29]

Prolonged exposure to didanosineis one of the main risk factors for developing non-cirrhotic portal-hypertension. Since the therapeutic options are not yet clear, symptomatic treatment of portal hypertension and discontinuation of didanosine should be considered as the primary options for treatment. [30]

Ascites is initiated by portal hypertension through leakage of excessive lymph from a congested liver, causing effective plasma volume to contract and renal sodium retention to follow as a consequence of this contraction .an observation showed the rate of ascites formation does not increase falling paracentesis nor does the plasma volume fall, both of which should occur if traditional concept of ascites formation is correct. [31]

Ascites could be made to reform in a patient with cirrhosis by administering a sodium retaining hormone. This observation indicates that it is possible for ascites to form as a consequence of plasma volume expansion in cirrhosis [31]

For the cirrhotic patients undergoing surgical or interventional shunts, the overall mortality was not significantly associated with the presence of portal vein thrombosis in previous studies. The presence of portal vein thrombosis might be associated with the long term mortality in non liver transplant patients with liver cirrhosis, but not with short term mortality. [32]

Quality of life is variably impaired in cirrhosis. All domains of health related quality of life, exceptpain were altered in cirrhosis [9%-42%] mainly in younger patients. There were minor differences in relation to gender were as etiology had no effects [33]

It is reported that the impact of chronic hepatitis-C progresses to cirrhosis in about 20% of patients .interferon treatment leads to transient responses in about 40% of patients and apparent eradication of infection in 7% -40% of patients [34]

One hundred and four patients with primary biliary cirrhosis and primary sclerosing cholangitis participated ,of whom 73% were women , with an average age 55+/-12 years. Of these patients 61% had cirrhosis (37% child's A ,23%child's B & 2% child's C)[35]

Portal hypertension accounts for the majority of morbidity and mortality that is encountered in patients with cirrhosis .recent data suggests that intrahepatic angiogenesis and sinusoidal remodeling could also been involved in sinusoidal resistance ,fibrosis and portal hypertension .[36,37]

METHODOLOGY

Description: The present study was conducted among 60 patients in a multi-specialtyhospital. A structured questionnaire was administered along with 24 hour dietary recall.

Participants: An observational study was done on 60 patients were various etiological factors were taken under consideration, patientprofile, anthropometricmeasurements, bio chemical data, clinical data,24 hour dietary recall, eatinghabits, social habits and past medical history.

Material and methods: A questionnaire was designed for 60 patients were different parameters were taken into account.

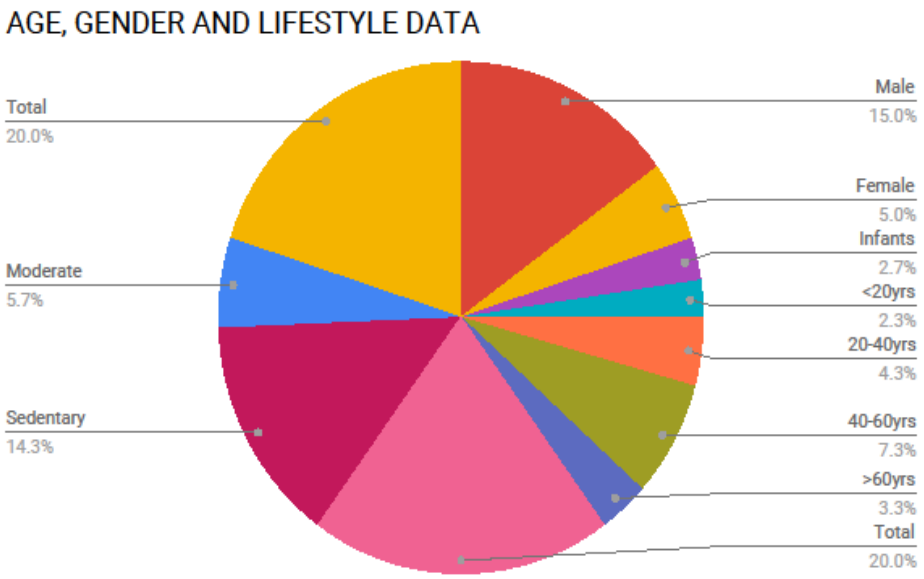
Firstly a one on one interaction was done with the patient were he/she was asked to tell the entire history of the disease outcome.

Secondly out of the above details the questionnaire was filled. Later on data analysis was done.

RESULTS AND DISCUSSION

Table 1:Socio economic profile of the respondents

Gender of respondents	Frequency number	Percentage
Male	45	75%
Female	15	25%
Age of respondents		
Infants	8	13.3%
<20	7	11.6%
20-40	13	21.6%
40-60	22	36.6%
>60	10	16.6%
Total	60	100%
Lifestyle		
Sedentary	43	71.6%
Moderate	17	28.3%
Heavy	0	0%
Total	60	100%

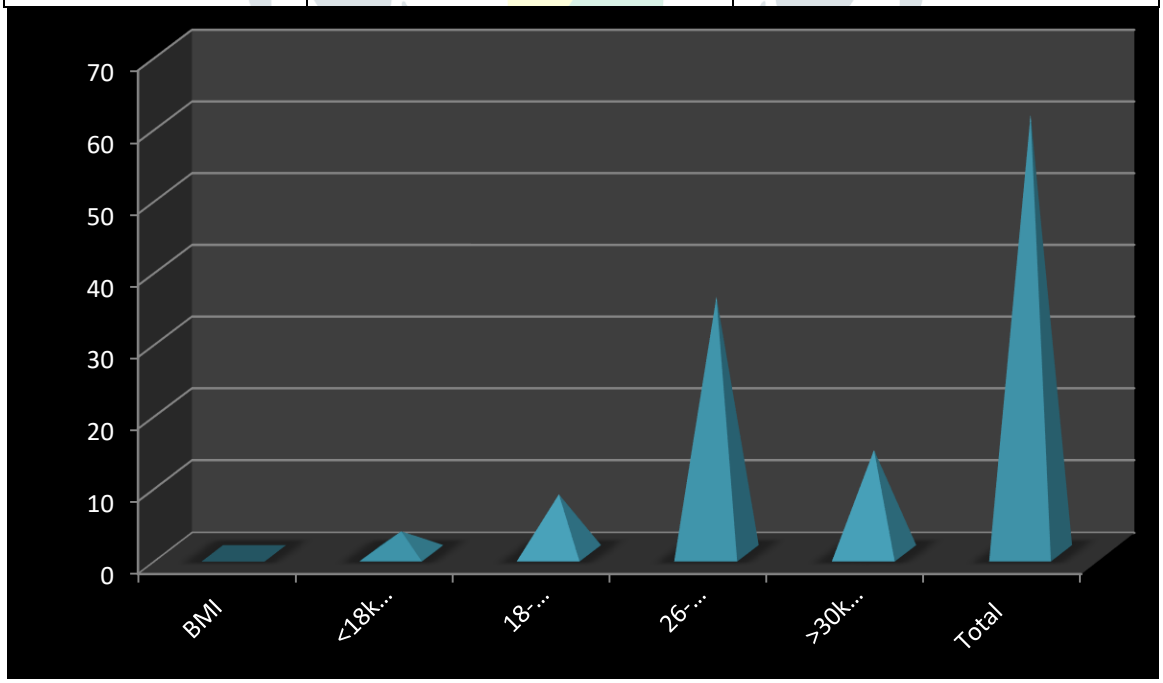


Total sample size of this study was 60 respondents out of total 60 respondents, 45(75%) were male and 15(25%) were female.

Lifestyle modifications leading to weight reduction and/or increased physical activity consistently reduced liver fat and improve glucose control/insulin sensitivity.Limited data also suggest that lifestyle interventions may hold benefits for histopathology. (41)

Table 2: Body mass index data

BMI	Frequency	Percentage
<18kgs/m2	3	5%
18-25kgs/m2	8	13.3%
26-30kgs/m2	35	58.3%
>30kgs/m2	14	23.3%
Total	60	100%

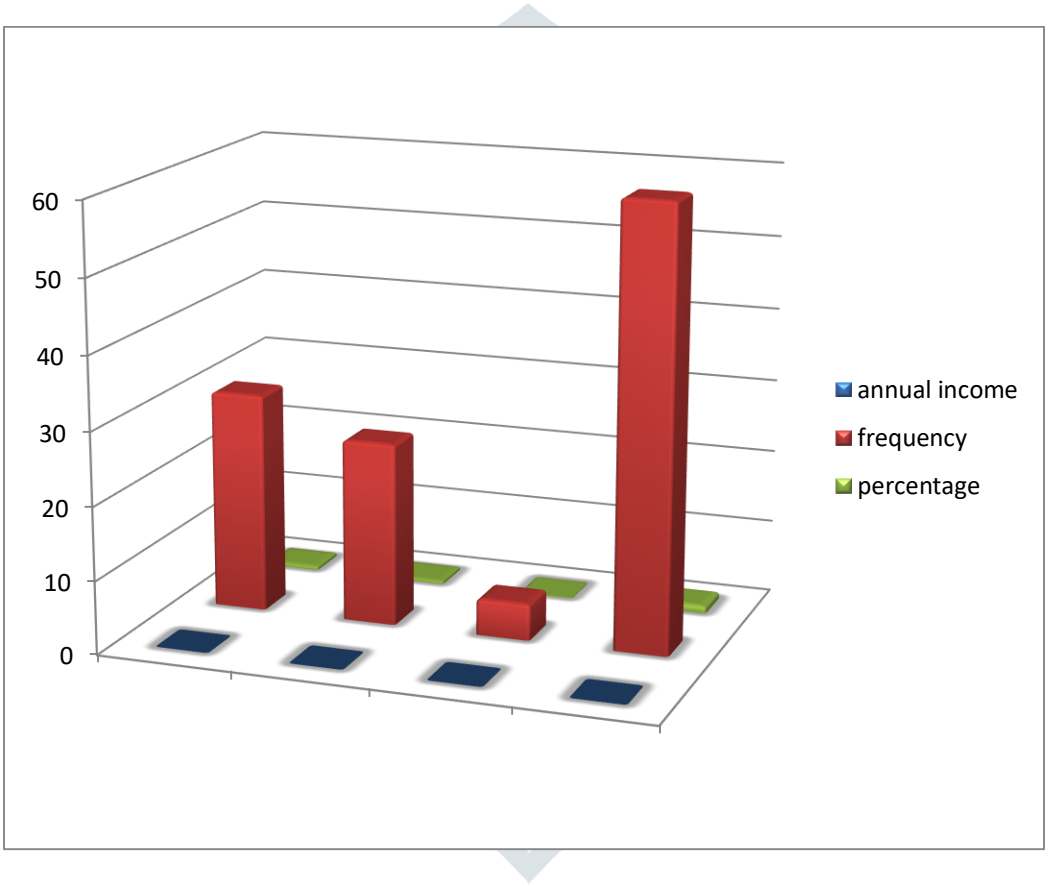


Out of 60 respondents 58% of the people were overweight, 23% were obese, 13.3% were healthy and 5% were underweight which shows that most of the CLD cases were present in overweight people.

Fifty eight of eighteen patients enrolled had varying degrees of non-alcoholic steatohepatitis, of these 26 had fibrosis and 8 had silent cirrhosis. The association of metabolic syndrome, female-sex, a long history of obesity and body mass index>45 were considered to be independent risk-factors for fibrosis. (40)

Table 3: Annual income data

Annual income	Frequency	Percentage
< 2 lakhs	30	50%
2-6 lakhs	25	41.6%
>6 lakhs	5	8.3%
TOTAL	60	100%

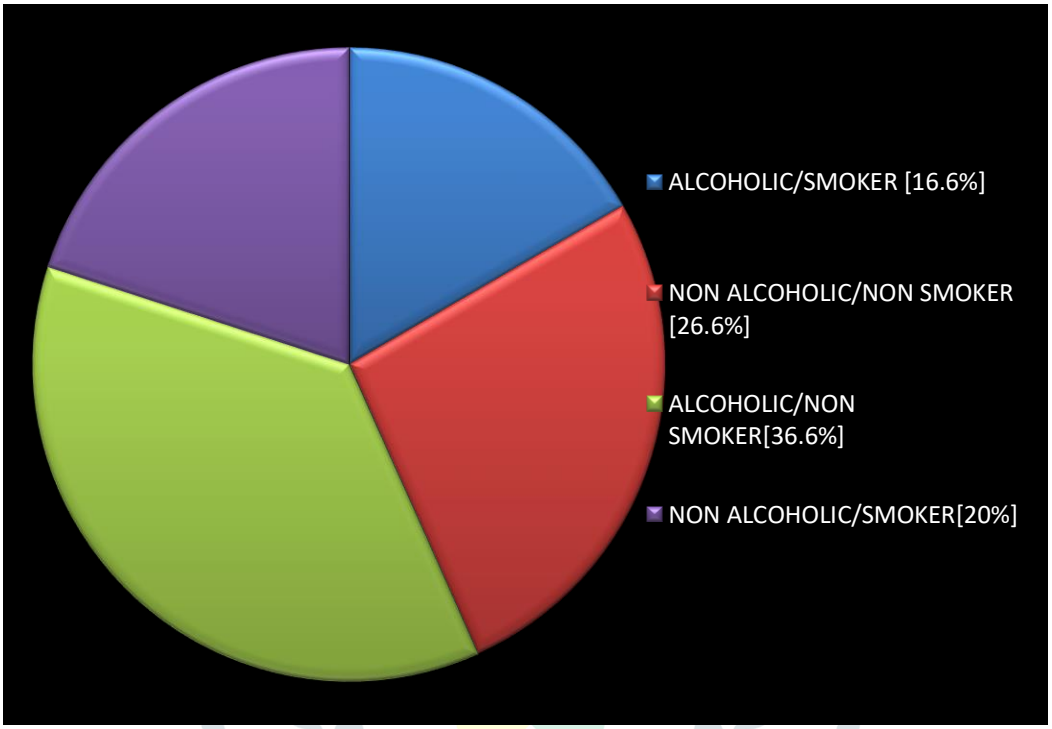


Out of 60 respondents 50% people annual income is below 2 lakhs, above 41.6 % people annual income between 2-6 lakhs , and about 8.3 % people annual income is greater than 6 lakhs .

According to National health interview survey 2017 about 792 people who were poor suffered from cld and about 809 nearly poor people also suffered from cld and about 2677 people who were rich suffered the most due to unhealthy social habits.[41]

Table 4: Social habits data

Social habits	Frequency	Percentage
Alcoholic / Smoker	10	16.6%
Non alcoholic / Non smoker	16	26.6%
Alcoholic / Non smoker	22	36.6%
Non alcoholic /Smoker	12	20%

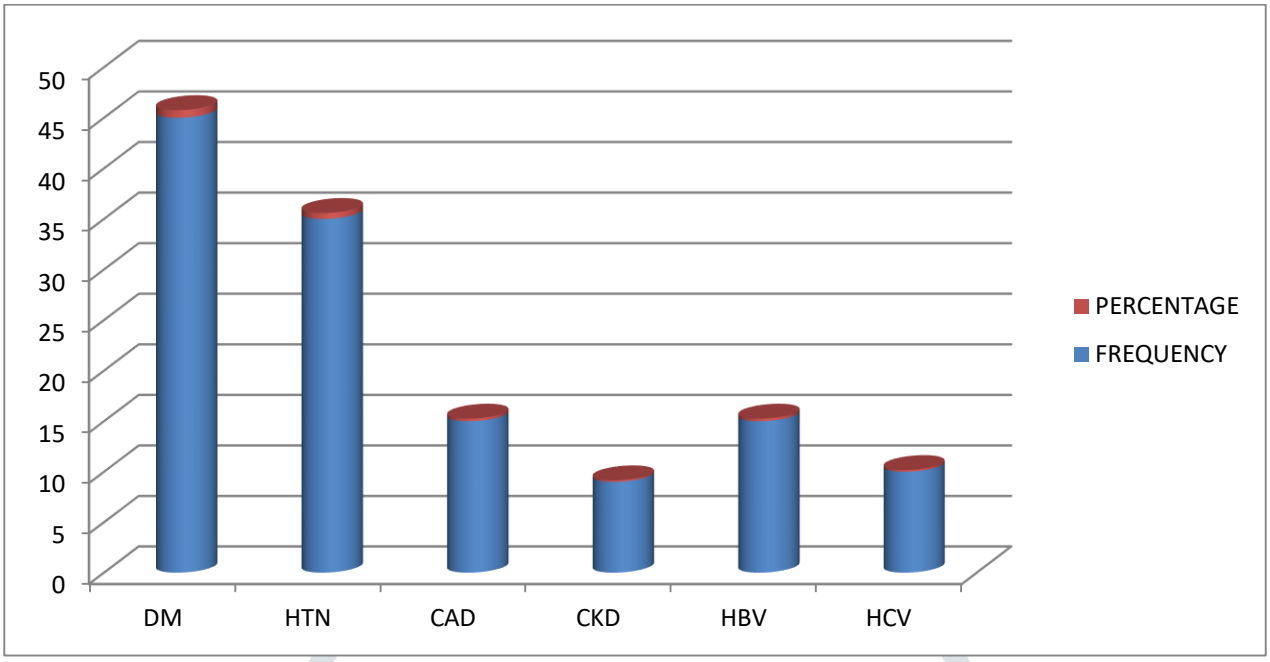


Out of 60respondents, 36.6% were alcoholic and non-smoker, 26.6% were non-alcoholic non-smoker, 20% were non-alcoholic smoker and 16.6% were alcoholic and smoker.

The prevalence rates for chronic liver disease were 11.78% (1998-1994), 15.66% (1999-2004), and 14.78 %(2005-2008).During the same period, alcoholic liver disease (1.38%, 2.21% and 2.05%) remain generally stable. In contrast, the prevalence of non alcoholic fatty liver disease increases from 5.51% to 9.84% to 11.0%. [42]

Table 5:Past medical history data

Diabetes mellitus	Hypertension	Coronary artery disease	Chronic kidney disease	Hepatitis b	Hepatitis c
45[75%]	35[58.3%]	15[25%]	9[15%]	15[25%]	10[16.6%]

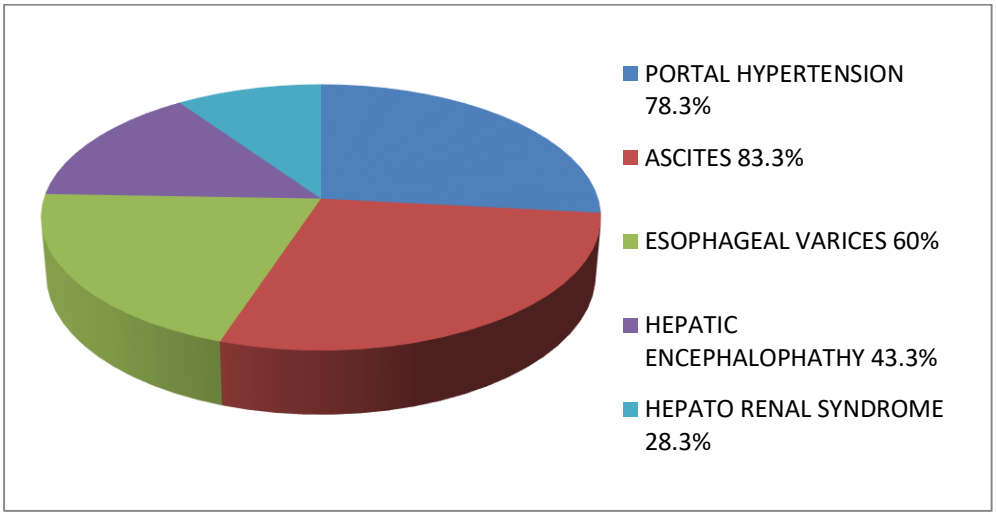


Out of the study 75% of people were having diabetes mellitus, 58.3 % of people were having hypertension, 25% of people were having coronary artery disease, 25% of people were having hepatitis B, 16.6 % of people were having hepatitis C,and 15% of people were having chronic kidney disease.

The prevalence of hepatitis B virus is 0.36%, 0.33%, 0.34% whereas the prevalence of hepatitis C is 1.95%, 1.97% , 1.68%,diabetes mellitus is 5.55%, 7.88%, and 9.11%,hypertension is 22.68%, 33.11%, 34.08% [44].

Table 6: Complications of chronic liver disease

Complication	Frequency	Percentage
Portal hypertension	47	78.3%
Ascites	50	83.3%
Esophageal varices	36	60%
Hepatic encephalopathy	26	43.3%
Hepato renal syndrome	17	28.3%



Out of the study 83.3% of people were having ascites,78.3% of people were having portal hypertension,60% of people were having esophageal varices,43.3% of people were having hepatic encephalopathy and 28.3% of people were having complication of hepato renal syndrome.

Sinusoidal intrahepatic portal hypertension most often is the result of fibrotic hepatopathies[45,46].Concurrent hypoalbuminemia secondary to hepatic synthetic failure lowers vascular colloid osmotic pressure that further aggravate ascites formation[47].In humans the hepatic renal syndrome is always accompanied by a state of refractory ascites and end stage liver failure[48,49].

Global study on figures of portal vein thrombosis [38]

First author [year]	Country	Number of total patients	Portal vein thrombosis number (%)
Amitrano (2012)	Italy	185	32 (17%)
Attili(2012)	Italy	129	25(19%)
Chen(2012)	Taiwan	101	25(25%)
D'Amico (2003)	Italy	291	37(13%)
Doumit (2009)	Canada	398	44(11%)
Hung(2012)	Taiwan	95	13(14%)
Lee (2012)	Taiwan	97	19(20%)

International incidence of chronic liver disease [39]

Frequency in 1000's:

Total number of liver disease	4497
Male	2261
Female	2236
18-44yrs	1247
45-64yrs	2258
65-74yrs	704
75 and 0ver	288
Total number of morbidity rate=4.5million Total number of mortality rate=40,545	

RECOMMENDATIONS

Chronic liver disease is a major public health problem throughout the world affecting hundreds of millions of people. It is a cause of considerable illness and death in human population from the acute infection or its effects, which may include chronic acute hepatitis, cirrhosis and primary liver cancer.

Avoiding alcohol after getting diagnosed with chronic liver disease helps reducing its complications.

Fatty changes in the liver are common whenever there is a high proportion of fat in the metabolic mixture, for example in uncontrolled diabetes , in starvation ,in some cases of obesity and when too much carbohydrate has been infused during intravenous feeding .

Modern dietary management of chronic liver disease essentially involves modification of the quality and quantity of food to be taken by the liver patients .the following guidelines are applicable to chronic liver disease irrespective of type, weight status, age, gender or occupation.

Dietary management in chronic liver disease

- Energy: consumption of food is difficult because of anorexia and ascites. The patient are usually emaciated by the time cirrhosis of the liver is diagnosed .the patient requires highly nutritious food i.e. high calorie diet is necessary for prolonged undernourishment.
- Protein: The serum albumin which is exclusively synthesized by the liver cells , is low in cirrhosis and aggravated by the loss of considerable amount of albumin into ascitic fluid
- Fats: even if fatty changes are present in the liver, fat should be given provided adequate amounts of proteins
- Salt restricted diet advised 0 gm
- Wide variety of cereals can be included liberally in their refined form
- Pulses to be included daily. cooked form is better tolerated
- Double toned milk and their products are preferred
- Cooking oil about 3 teaspoons per day inclusive of ghee, butter
- Whole fruit to be preferred , avoid fruit juices

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CASE STUDY FORMAT

I. NUTRITIONAL ASSESSMENT

1. Patient profile:
   a. Patients name-
   b. Age-
   c. Sex-
   d. Life style-
   e. Date of admission-
   f. Date of discharge-
2. Anthropometric measurement:
   a. Height-
   b. Weight-
   c. BMI-
   d. IBW-
   e. DBW-
      - Assessment: (modified MUST tool is used for assessment)

Nutritional screening:-

Patient has been identified to be at minimal risk and does not need further assessment.
Patient has been at nutritional risk and must undergo detailed nutritional assessment.

Nutritional Risk Factor:

- ○ Inadequate PO intake
- ○ Chewing/swallowing problem
- ○ Significant weight loss
- ○ Mouth ulcer
- ○ Poor skin integrity
- ○ Abnormal lab values
- ○ Dxof GI tract
- ○ Increased nutritional need
- ○ Nausea/vomiting
- ○ Other

Short term goals/recommendations:

- ○ Loose/gain weight
- ○ Maintain present nutritional status
- ○ To improve nutritional status
- ○ Maintain blood sugars within limit
- ○ Increase physical activity

3. Biochemical data:
   a. Diagnosis-
   b. Investigations-

4.Clinical data:

   a. Present complaint-
   b. Past medical history-
   c. Family history-
   d. Medications-

   e. Treatment/plan-

4. Dietary history(24hrs recall-

QUESTIONNAIRE TO ELICIT THE INFORMATION ON CHRONIC

LIVER DISEASE WITH PORTAL HYPERTENSION

General information:

1. Name:

2. Age and gender:

3. Marital status:

4. Profession:

5. Lifestyle:

(A) Sedentary (b) moderate(c) heavy

6. What is your annual income?

(a) BelowRs.2lakhs (b) Rs.2lakhs-4lakhs (c) Rs.4lakhs-6lakhs (d)> 6l

Anthropometric measurements:

1. Height:

2. Weight:

3. BMI:

4. IBW:

5. Dry body weight:

Socio economic data:

1. Family type:

a. Nuclear ( ) b. Joint ( ) c. Single ( )

2. Total number of family members: 1, 2, 3, 4 or more ( )

Eating habits:

1. How is your appetite?

(a) good

(b) Fair

(c) Poor

2. What is your food choice?

(a) Vegetarian

(b) Non vegetarian

(c) Jain

3. What is your bowel moment frequency?

(a) Once

(b) Twice

(c) Thrice

4. What is your total oil consumption per month per head?

(a) 1-2lt

(b) 3-4lt

(c) >5lt.

5. What is your salt consumption per day?

(a) 1tsp

(b) 1 ½ tsp

(c) 2tsp or more

6. What is your fruit consumption per day?

(a) Everyday

(b) Twice

(c) Thrice

7. What is your number of meals per day?

1( ) 2( ) 3 or more ( )

8. What is your fluid intake per day?

(a)1-2lt (b) 3-4lt(c)>5lt

9. Do you have any food allergies?

If YES then _____NO ( )

10. Do you consume any?

(a) Bakery products like (bread, pastries, biscuits etc.)

(b) Savoury products like (pickles, papads etc.)

(c) None of the above

11. Do you consume junk food in a week [yes/no?]

a) Onceb) twice c) more than two days

12. Do you consume fatty products like [yes/no?]

a) Ghee b) butter c) cream d) any other_____

Social habits:

(a)Smoking (b) alcoholic(c) tobaccochewing (d) anyother (e) none

13. How many numbers of cigarettes do you consume per day?

(a)2 (b)3 (c)more than 3

Physical activity:

1. Do you do physical activity [yes/no], if yes then how much then how much time do you spend

(a)1 ½ hr. (b)1hr (c)more than 1hr

2. What are your sleeping habits/no. of hours you sleep (a) 2-4hrs (b) 5-6hrs (c) 6-8hrs

3. Do you had any weight loss or weight gain if yes then

(Intentional or unintentional)

Medical history:

1. Do you have any past medical history?

(DM, HTN, CLD, CKD, ANY OTHER_____)

2. Do you consume any supplements like [yes/no?]

(a)Vitamin d (b) iron (c) multivitamins

If yes then since from how long_____

3. Do you consume any herbal medicine yes/no if yes then_____

4. Are you consuming any ayurvedic or herbal medicine (if yes_____/no?)

5. Do you had any GI complications (yes____/no)

6. Do you have any family history of?

Diabetes mellitus (), Hypertension () Coronary artery disease ( ) Hepatitis b ( ) or any other_____

7. Do you have any past surgical history (if yes_____/no?)

IS LIFE WORTH LIVING? IT ALL DEPENDS ON LIVER!!

A Survey On Nutrition Knowledge And Practices Regarding Their Children's Nutritional Needs And Dietary Habits Among Mothers Of School Going Children (5-15 Yrs)

Mrs.Meena Kumari[1], Ms Nasreen Begum[2], Charu Agrawal[3], Sejal Harkut[4]

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ABSTRACT

Background: Healthy eating behaviors in childhood are very important. It helps prevent malnutrition, growth retardation, and acute child nutrition problems, in addition to preventing chronic, long-term health problems such as cardiovascular diseases, type 2 diabetes, cancer, obesity, and osteoporosis. Parents are mostly responsible on this subject (Nicklas, 1995; Nicklas & Hayes, 2008). Parents are effective on their children's eating behaviors and preferences. Especially, mothers are the role models of their children about eating behaviors.

Objective: Purpose of this study is to assess mothers' nutritional knowledge of their children's nutrition needs and requirements and their practices regarding packing healthy lunches and dietary habits of their school going children aged between 5-15 yrs

Method: A pre tested structured questionnaire was given to the mothers to determine their nutritional knowledge and attitudes and behaviors about their children's nutrition. Total 480 mothers were interviewed via questionnaire method. Results indicated that many of the mothers who have higher nutritional knowledge level pack healthy foods from all the food groups and their children have normal weight. Also I was observed that a large percentage of children consume food while watching television which is not considered healthy.

Result: The mothers who have higher level nutritional knowledge feed their children more with vegetable, fruit, legumes, and less sugared drinks such as pops, juice and fast foods than the mothers who have lower level of nutritional knowledge. Also, higher nutritional knowledge level mothers avoid giving the foods which contains high sugars to their children, and believe more the knowledge about nutrition-health. Mothers' nutrition knowledge level affects children's eating habits.

Conclusion: Diet and nutrition of children influence their current health status and scholastic performance and also have long term consequences reaching well into their adulthood. The awareness of good eating habits and nutritional practices among mothers of school going children is very essential.

Key words: childhood Nutrition, Nutritional Knowledge, packed lunches, school going children, importance of healthy eating

INTRODUCTION AND REVIEW OF LITERATURE

Childhood nutrition is central to healthy human development and is an important public health issue worldwide (WHO, 2002;2009)

The nutritional status of children is important as it determines their health, physical growth and development, academic performance and progress in life. All children have the right to adequate nutrition, which is essential for attainment of the highest standard of health (1)

Moreover, good nutrition has been reported to be the corner stone for survival, health and development in the current and succeeding generations (2). Globally, malnutrition among school age children is becoming a major public health concern. More than 200 million school age children are stunted and if no action is taken, and at this rate, about 1 billion stunted school children will be growing up by 2020 with impaired physical and mental development (3).

School-age children constitute a little less than one quarter of the world's population, and around three quarters of these children live in developing countries.1 A child's dietary habits acquired early in childhood continue into adulthood.2 The school going ages form the foundation of future life in terms of physical, emotional and mental aspects and strongly influence the child's health in

her/his adult life.3,4 Adequate and appropriate dietary intake is essential in these ages for inculcating healthy eating habits so as to provide nutrients not just for the immediate growth, development and scholastic (11)

In the past decades, transitions in dietary intake among children have been observed and characterized by a higher intake of foods rich in fats, sodium, and sugar and by lower
Intakes of nutrient dense foods such as fruit and vegetables. (2,3) These changes in food intake have Had a major impact on the development of obesity and nutritional deficits. In addition, studies have suggested the role of child- hood nutrition on the development of morbidity in further life cycles, such as in adulthood. (4,5)

Food habits acquired during childhood persist into adulthood and form the basis of either good health or ill health, as the case may be, in the coming years. Hence there is a need to educate parents, especially in the middle and higher socioeconomic groups regarding correct dietary habits for the children to ensure that they can live healthy and productive lives as adults.(11)

The dietary habits of individuals /families /communities vary according to socioeconomic factors, regional customs, traditions, seasonal availability of food items etc. While there are various methods of qualitative and quantitative diet surveys, finding a suitable method of assessing dietary intake for the population under study poses, at times several problems.(8,11) Dietary assessment of schoolchildren may be difficult as children due to limited attention span and issues of recall and cognitive abilities for self reporting may not be able to provide accurate responses. Hence researchers usually have to rely on collecting information from the parents or caregivers and while this seems to be a satisfactory alternative when the population of interest is smaller children, however parents may at times be unaware what older children consume when away from home.6 Qualitative diet surveys can be used to gain qualitative details of diet and for studying the patterns of food consumption, food likes/dislikes etc at a household level. This method has been used to study meal patterns, dietary habits, preferences and avoidances and weaning and infant feeding practices.(12)

Parents play an important role as their young child develops dietary habits (4,5). Parents influence children's familiarity with and preferences for fruits, vegetables and whole grains by controlling the availability, accessibility and exposure to those foods (6,7,8,9). The child's consumption of fruits vegetables and whole grains is in turn dictated by their developed food preferences, food availability and accessibility (10).This survey was carried out to understand the mother's knowledge and practices regarding nutrition of their school going children

AIMS AND OBJECTIVES

1. The objective of this survey was to study the feeding and physical activity patterns of the school going children of age 5-15 years.
2. To assess the knowledge about Nutrition breakfast and packed lunches for school going children among the mothers.
3. To spread awareness and educate the mothers about the importance of childhood nutrition.

MATERIALS AND METHODS

The study was conducted using Qualitative diet survey method by oral questionnaire method. a descriptive, structured questionnaire in 480 mothers of school going children in ages 5-15 yrs.

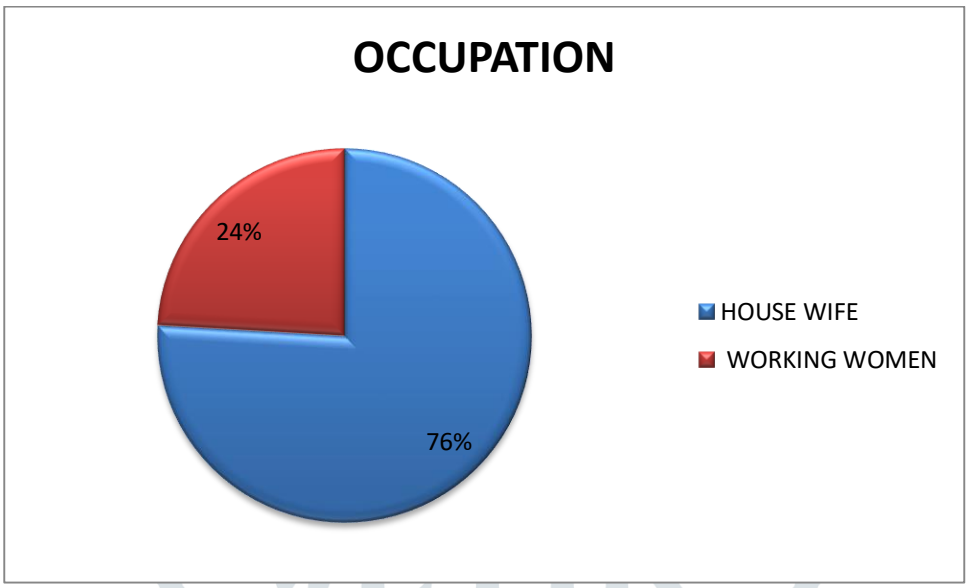
The questionnaires were distributed to all parents, after taking their consent and explaining to them the purpose of the study. The method of filling the questionnaire was explained in detail and parents were assured about confidentiality of the contents. The data collected was on the food habits, frequency of various types of food eaten and the preferences/dislike to various food items and mothers knowledge on children's nutritional needs.

The information was obtained by conducting face to face interview method. The questionnaire was used to elicit information to collect information on (i) age, education qualification, , (ii) knowledge on Nutritional needs, (iii) attitudes towards food and its various groups and (v) healthy packed lunch practices.

The responses were analyzed using Microsoft excel and Google docs.

RESULTS AND DISCUSSION

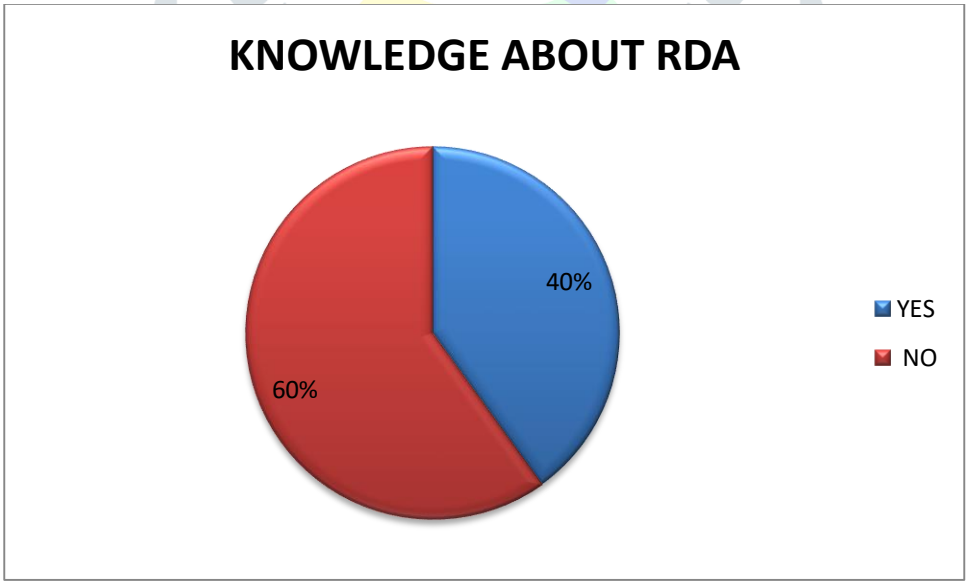
1. The survey was conducted in 480 mothers of school going children out of which 56% were between 25-35 years and 44% were between 35-45 years of age.



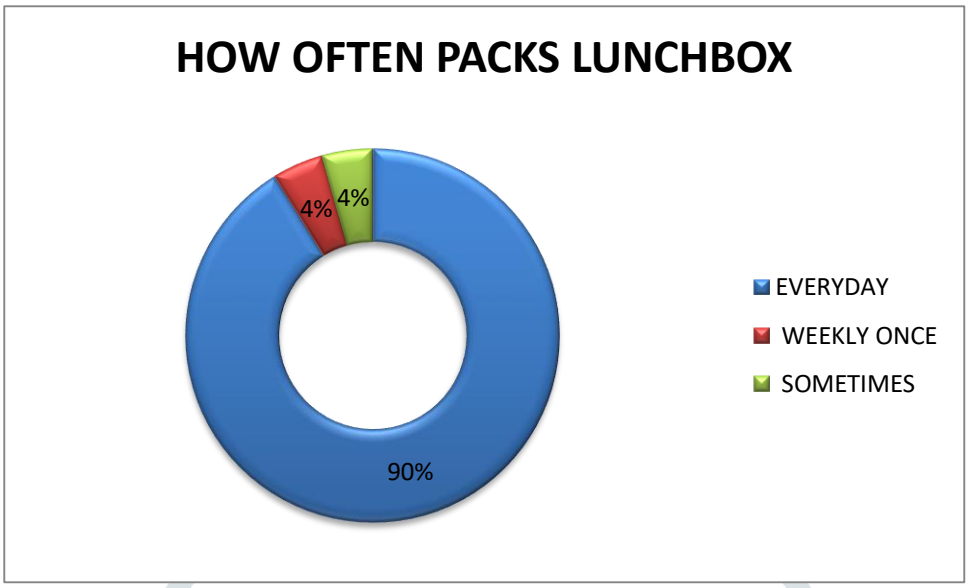
Around 76% participants were housewife and remaining 24% participants were working women.

Ages of the children

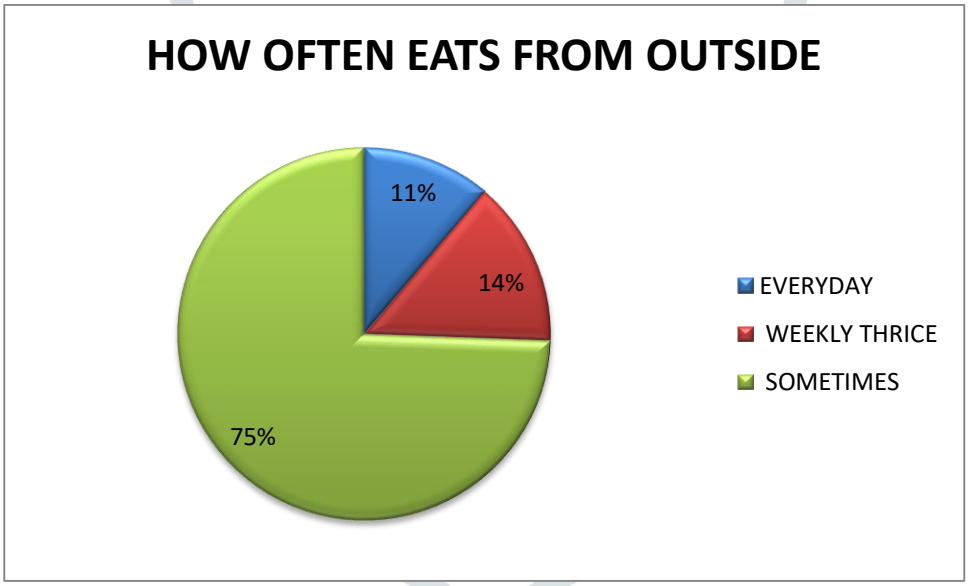
Around 5% children were 6 years old, 11% were 7 years old, 14% were 8 years old, 19% of children were both 9 and 10 years respectively. And 13% were both 11 and 12 years old respectively. 4% of children were 13 years old and remaining 2% children were 14 years old.



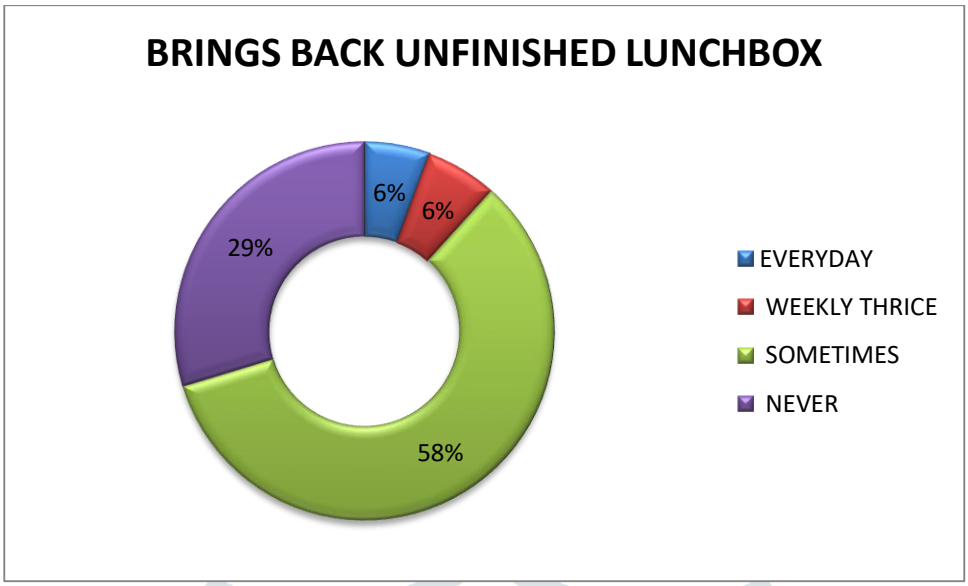
2. Out of 480 women only 40% women had the knowledge about RDA, rest 60% women were unaware.



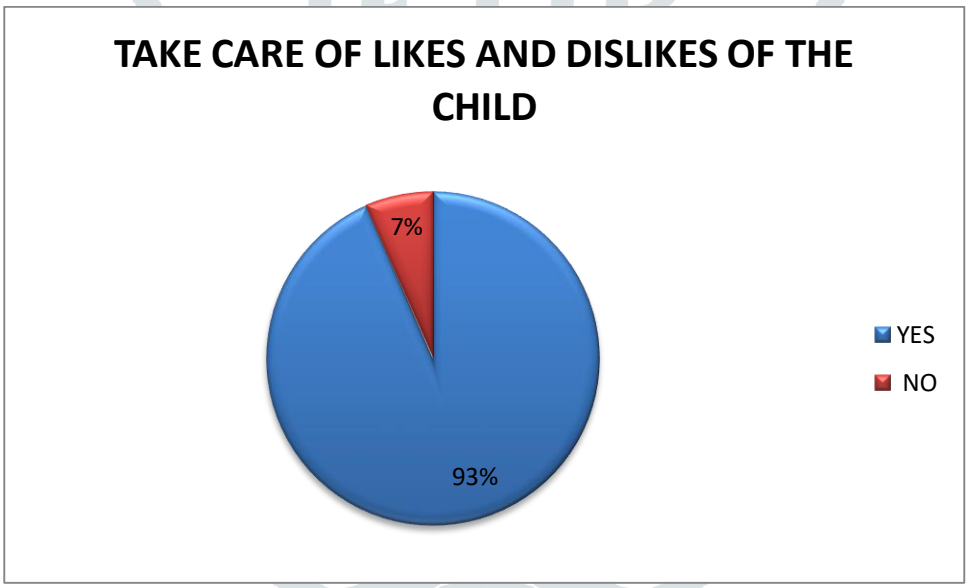
3. 90% mothers pack lunch box for their child on daily basis. 4% weekly once and remaining 6% women packs lunchbox sometimes for their child.



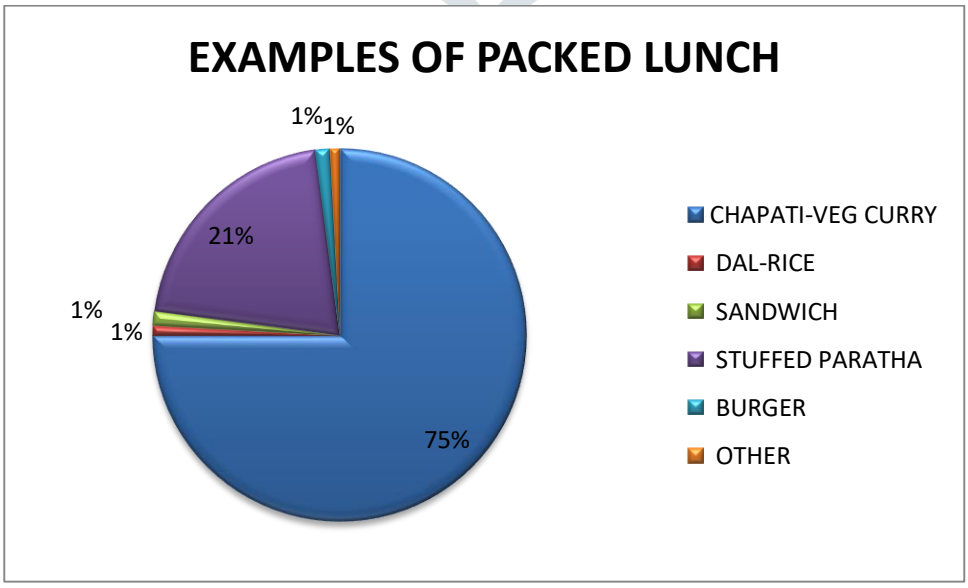
4. All children eat outside food but 11% children eat everyday from outside, 14% weekly thrice whereas remaining 75% eats sometimes from outside.

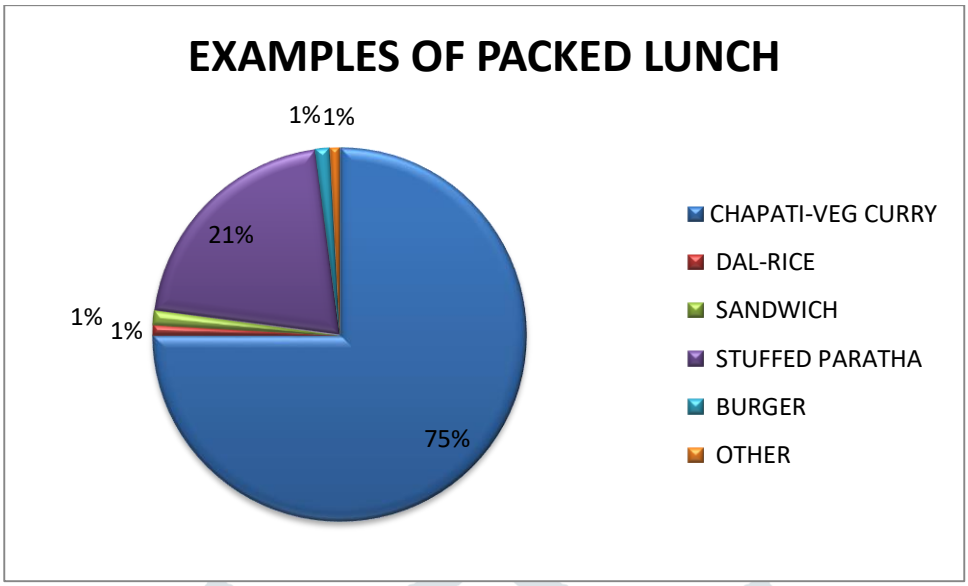


5. Out of all children only 6% children brings unfinished lunchbox everyday, 6% weekly thrice, 58% sometimes and remaining 29% children never brings back unfinished lunchbox.



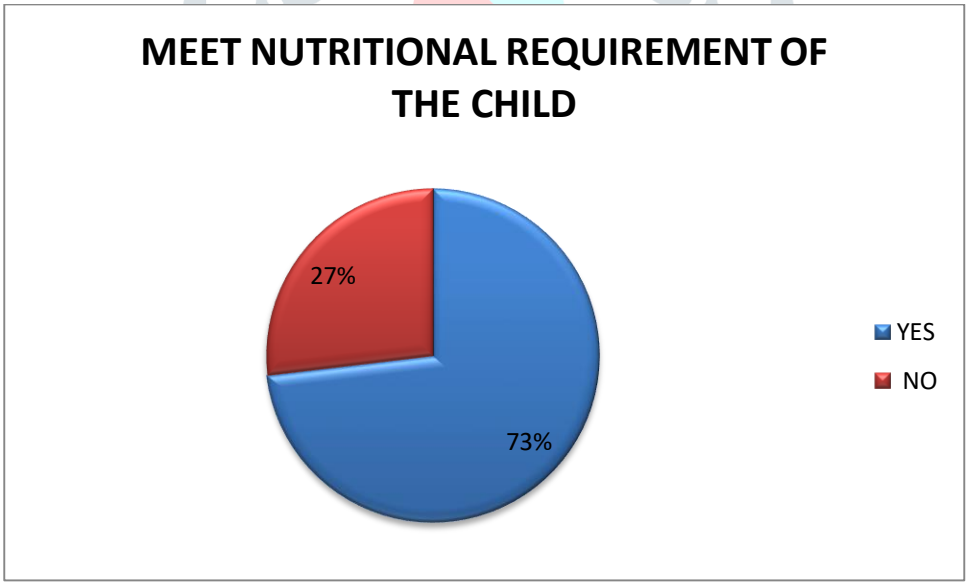
6. Around 93% mothers take care of likes and dislikes if their children, remaining 7% don't.



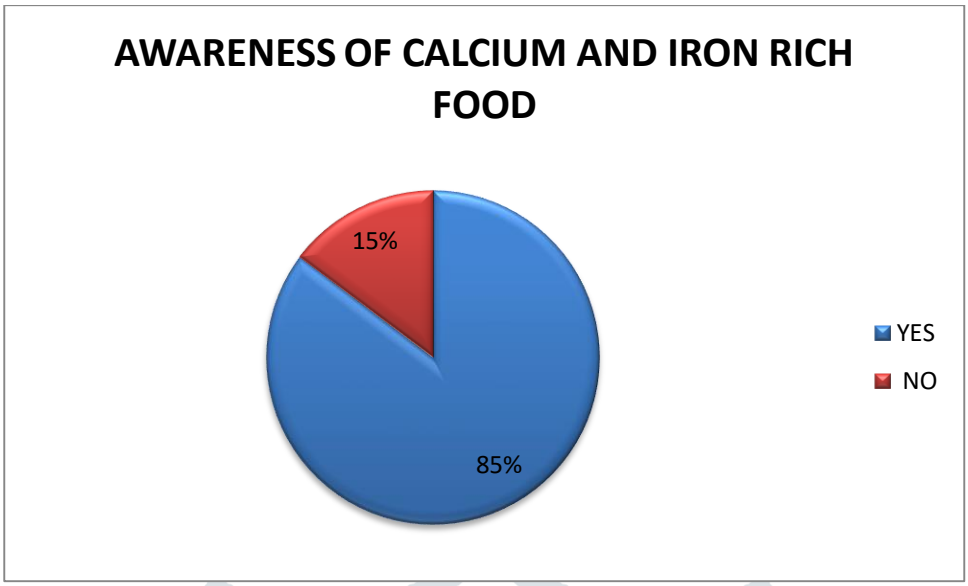


7. Various food items were packed as lunch of the children. Like 21% times chapati and veg-curry, 19% dal-rice, 21% sandwiches, 10% stuffed parahta, 10% burger and 19% other food items.

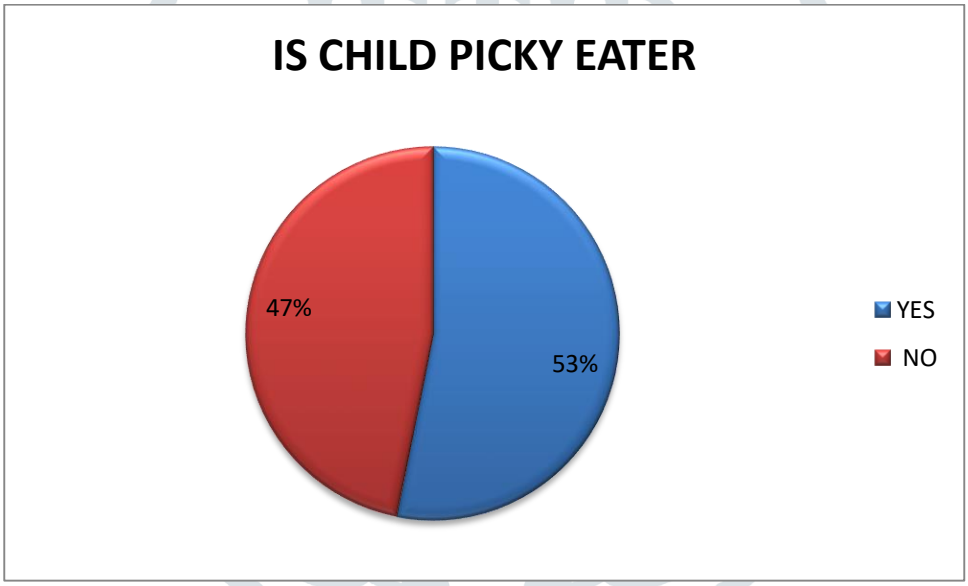
8. According to the survey, chapati was given 80% on daily basis, 22% 2-3 times a day, 8% weekly once. Whereas rice was given 75% of, the mothers gave rice daily 20% 2-3 times a day, 5% weekly once . Similarly all food groups were included in their diet in different quantity.



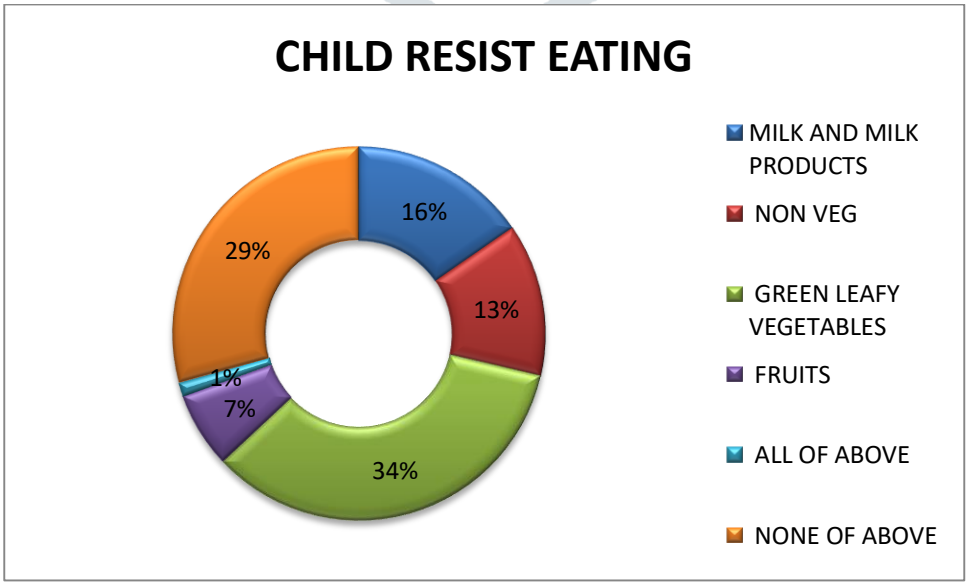
9. According to the survey, upon analysing food frequency data around 73% of children meet their RDA while remaining 27% don't.



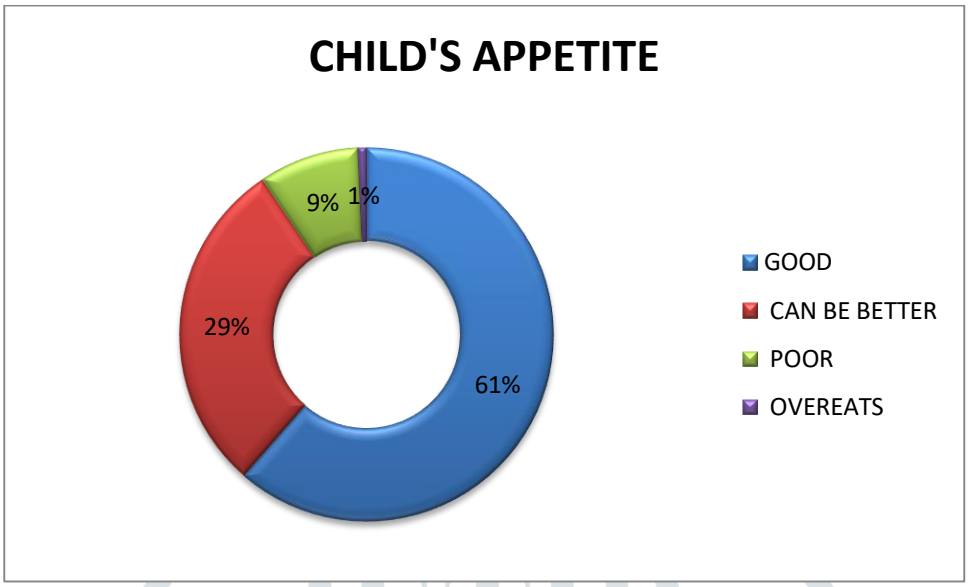
10. Out f 480 mother, around 85% of mothers were aware of calcium and iron rich foods while remaining 15% were unaware



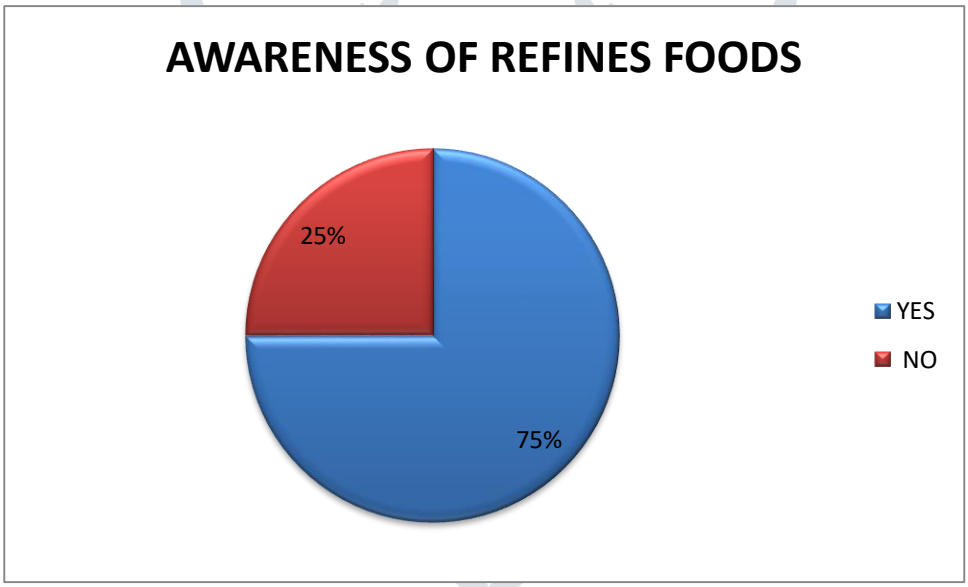
11. According to the survey, around 53% of the children are picky eaters.



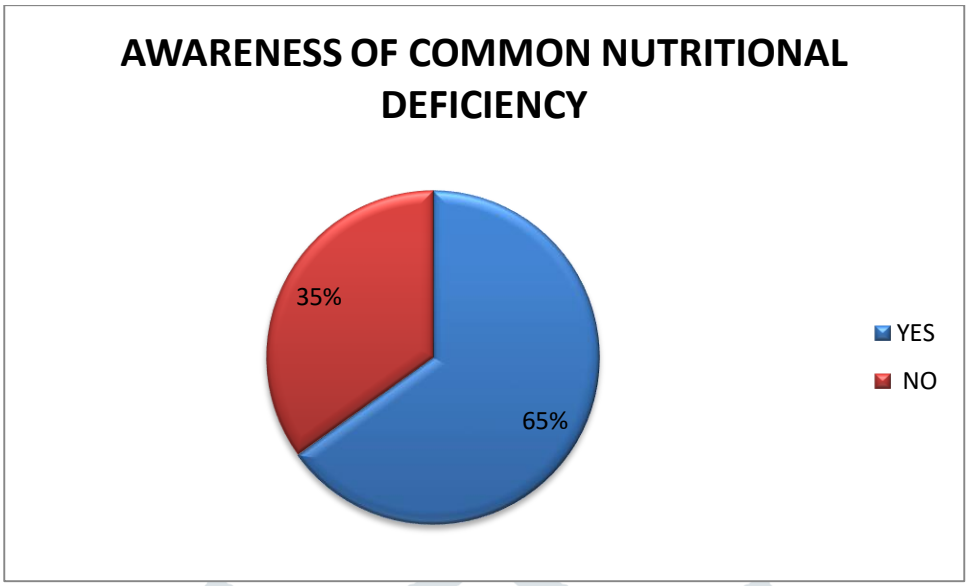
12. It was found that 16% children don't like to eat milk and milk products, 13% non-veg, 34% green leafy vegetables, 7% fruits, only 1% all of the above and 29% none of the above.



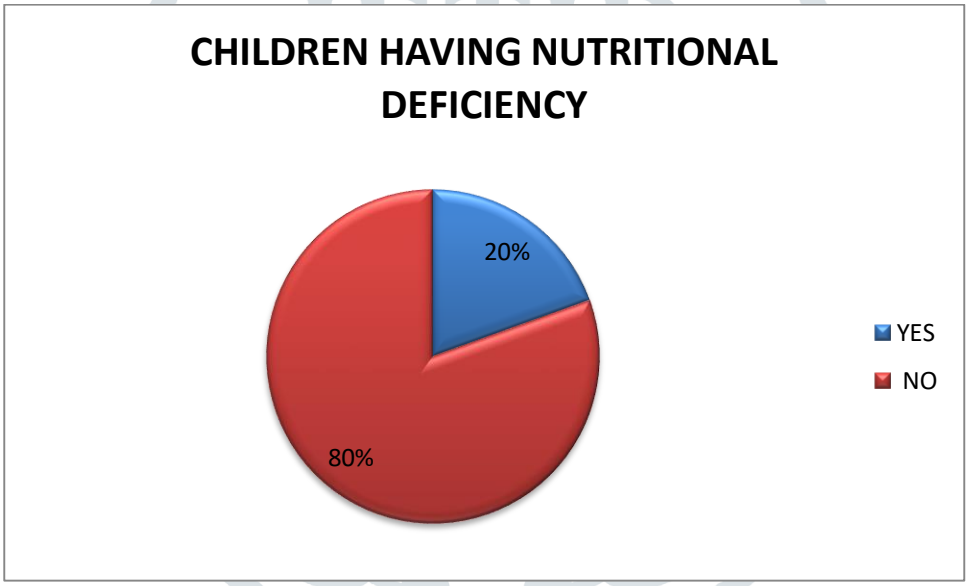
13. According to the survey, 61% of the children have good appetite, 29% think that it can be better, 9% children have poor appetite and remaining 1% overeats.



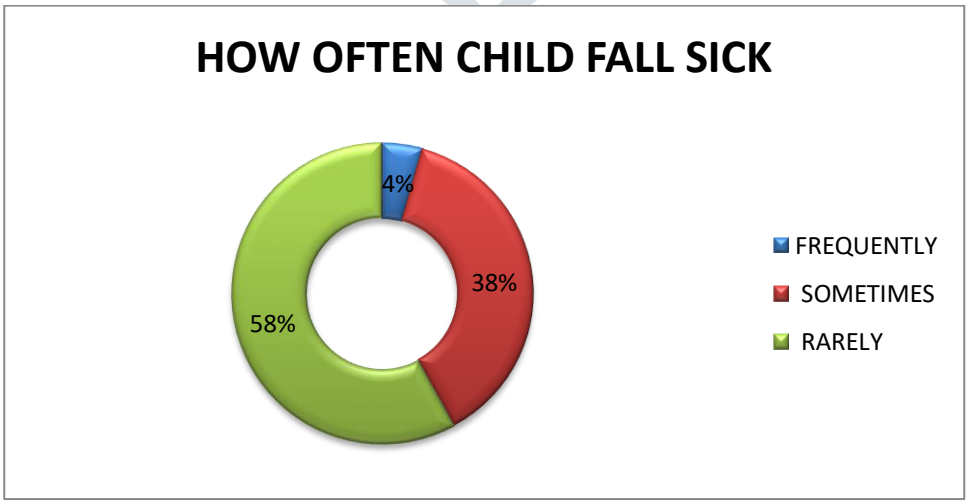
14. We found out that about 25% of the mothers were unaware of the refined foods which are not to be given to the children, remaining 75% mothers were aware.



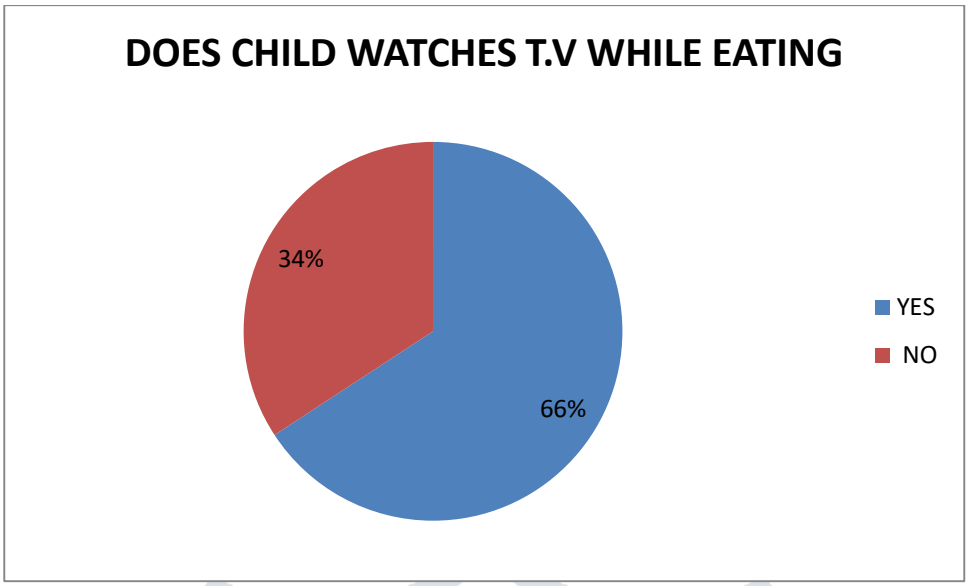
15. Around 65% of the mothers were aware of the common nutritional deficiencies whie remaining 35% mothers were not.



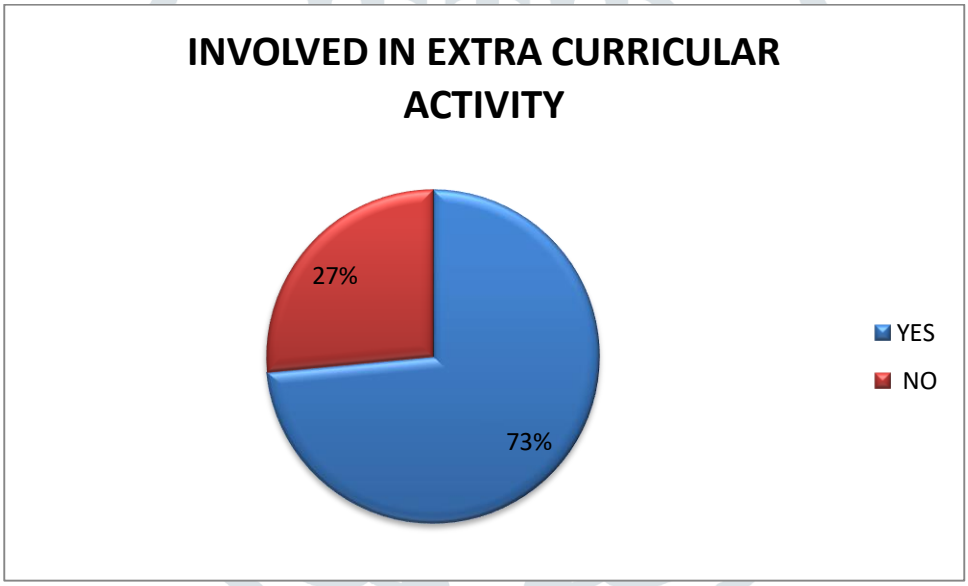
16. It was found that around 80% of children were not having any nutritional deficiency while remaining 20% children were nutrient deficient.



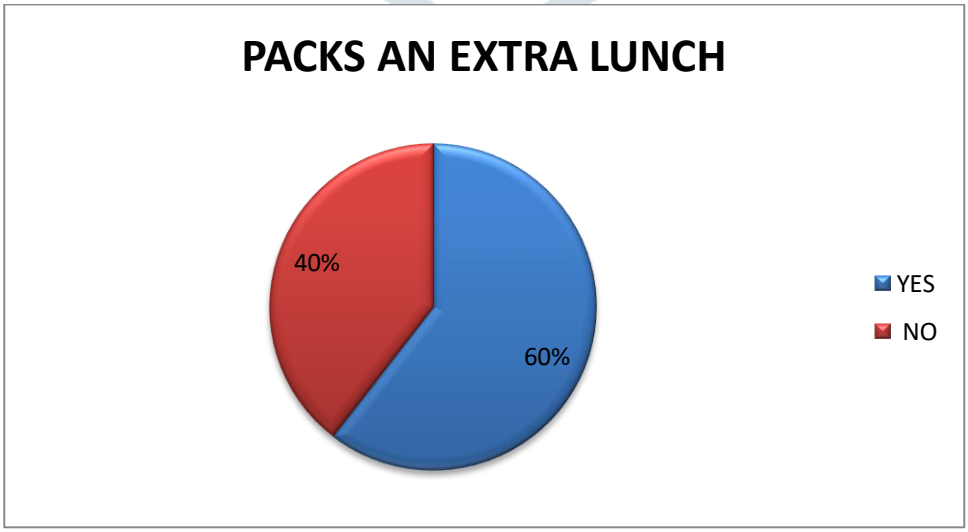
17. According to the survey, out of all, around 58% of children fell sick rarely, 38% sometimes while only 4% children fall sick frequently.



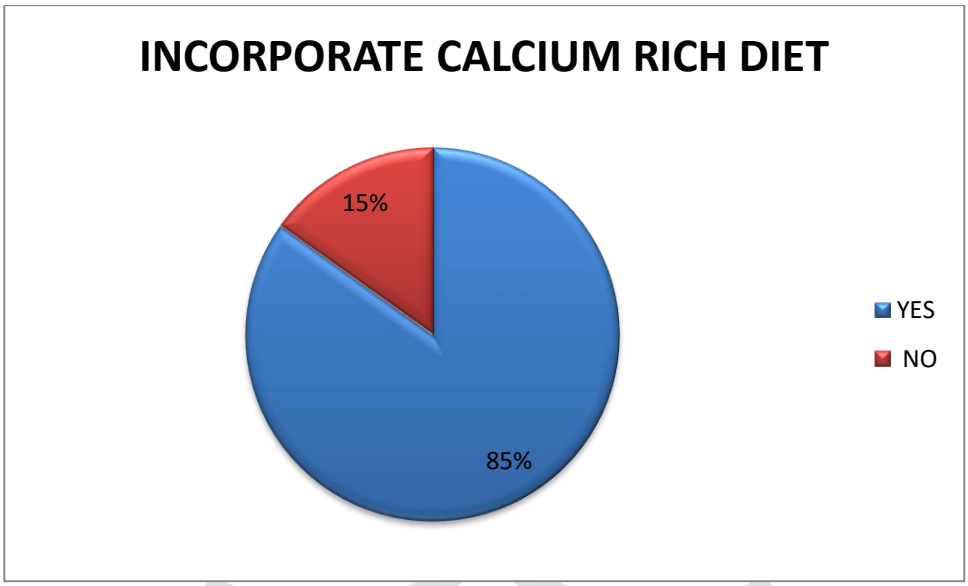
18. Almost 66% children eat their food while watching T.V. while remaining 34% don't.



19. Around 73% children are involved in extra curricular activity.

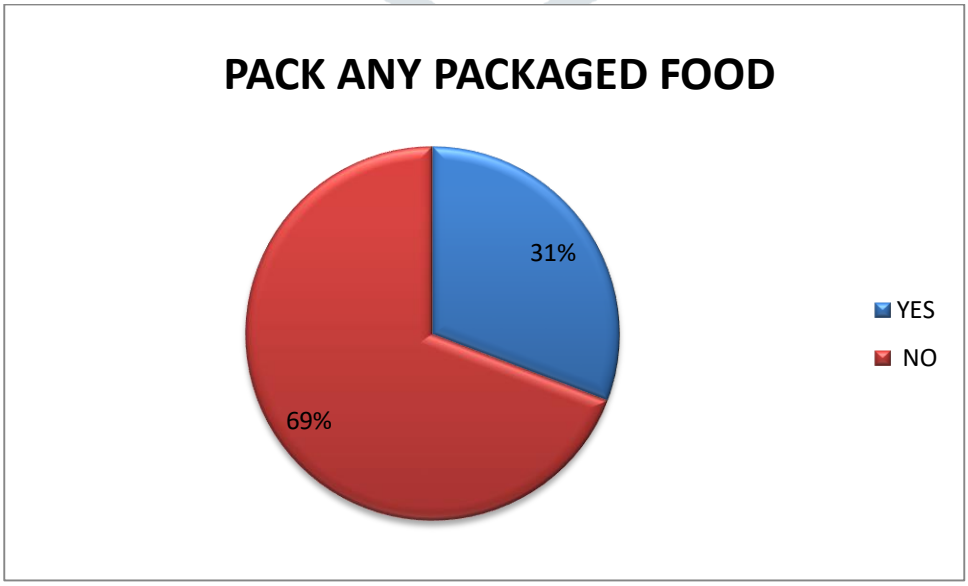


20. It was found that around 60% mothers packs an extra lunchbox for their child if he is involved in extra curricular activity, while 40% others don't pack.

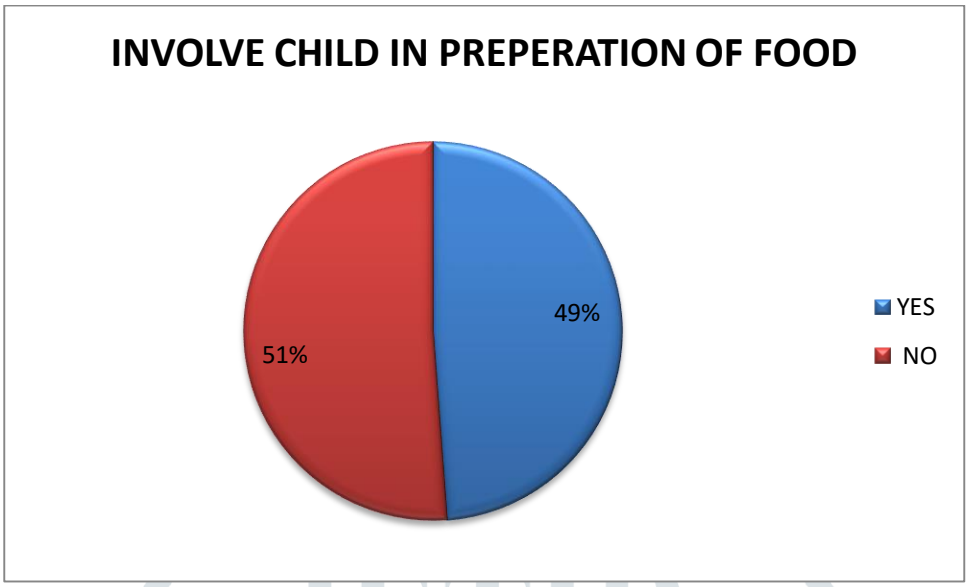


21. 85% mothers provide their children with iron and calcium rich foods.

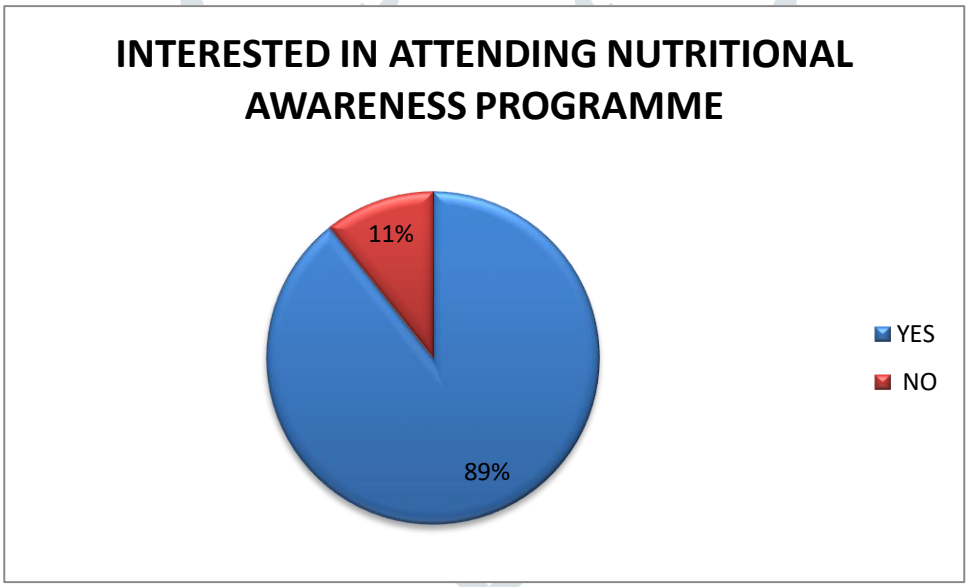
22. It was found that around 80% mothers give nutritional supplements to their child.



23. 69% of the mothers don't give their children packaged food items while remaining 31% mothers prefer giving it to their child.



24. According to the survey, Only 51% mothers involve their children in preparation of food at home, remaining 49% mothers don't.



25. It was found out that around 89% mothers were interested in attending nutritional awareness programme while remaining 11% mothers were not interested.

DISCUSSION

Form the above survey we are able to draw out various conclusions. We are able to learn that most of the mothers are aware of the general dietary guidelines for their children. They are concerned of the eating habits of their children. Most of the mothers also know about the various important food nutrients that are essential for the children and also the deficiencies related to them. Mothers are aware about a number of food items and their nutritional values mothers do take care of their children's eating habits besides what they eat. The likes and dislikes of the children are also considered. There are a few mothers that also complain about the appetites of their children that have to be improved. They also complain about the fact that there a few food items in particular that their children resist such as milk and milk products, green leafy vegetables, fruits or non-vegetarian items resulting in various deficiencies in the body. Mothers should be educated to add varieties to the diet so that the kids are attracted to eat. Mothers should also include their children during the preparation of their lunches so that even the children inculcate the habit of packing their lunches. It should be taken care that children eat well and follow a healthy lifestyle

The lunch boxes should preferably consist the chief nutrients such as carbohydrates, proteins, essential fats, fundamental minerals and vitamins.

Apart from a wholesome breakfast, a healthy and fulfilling packed lunch helps the child to boost concentration and provides energy for the day.

Therefore mothers should be educated and trained for better lunch practices of their children to provide them a healthy and better life. Through the present survey many of the mothers agreed to participate in nutrition awareness programs which could help them enhance their knowledge regarding children's nutrition

CONCLUSION:

Diet and nutrition of children influence their current health status and scholastic performance and also have long term consequences reaching well into their adulthood. Further, diet preferences and practices acquired during childhood usually persist for life. Data on nutritional intake of school children is required by public health policy makers to be able to formulate nutritional intervention and also for nutritionists and general practioners to be able to advice parents and care givers regarding the inadequacies in the diet.

The awareness of good eating habits and nutritional practices among mothers of school going children is very essential. Children at a tender age cannot particularly decide what is beneficial for them to eat and what has to be avoided, therefore mothers play an important role in the well-being of their children .Emphasis should mainly be on the lunch practices of the children. Packed lunches are a very necessary part of the daily diet routine for the kids as the schools are either too far or the lunch breaks are too short for the children to come home and have their lunch. Hence, packed lunch containing the Basic Four Food Groups in adequate amounts should be provided to meet the daily requirements for the growth and development of the child.

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ANNEXURE 1

ST. ANN'S COLLEGE FOR WOMEN
DEPARTMENT OF NUTRITION

A Survey On Nutrition Knowledge And Practices Regarding their children's' Nutritional needs and dietary habits Among Mothers Of School Going Children (5-15 Yrs)

GENERAL INFORMATION

Name of the respondent: _____

Age of the respondent: _____

Educational qualification: _____

Occupation: _____

Contact number: _____ E-mail: _____

Number of children (between 5-15years): _____

PACKED LUNCHES

1. Do you know what are the Recommended Dietary Allowances (RDA) for your child?
   Yes/No

2. How often do you cook and pack your child's lunch?
   (I) Everyday (II) Weekly thrice (III) Sometimes

3. How often does your child eat lunch from outside?
   (I)Everyday (II) Weekly thrice (III) Sometimes

4. How often does your child brings back unfinished lunch box?
   (I) Everyday (II) Weekly thrice
   (III) Sometimes (IV) Never

5. Are the likes and dislikes of your child kept in mind while packing lunch?
   Yes/No

6. Examples of packed lunches that you pack

7. FFQ for packed lunches

S.NO.	FOOD ITEMS	QUANTITY	Frequency Daily/weekly twice/ weekly 3 times/ never
1.	Chapati		
2	Rice		
3.	Green leafy vegetables		
4.	Other vegetables		
5.	Non- vegetarian		
6.	Dals		
7.	Fruits		
8.	Milk and milk products		

NUTRITIONAL AWARENESS

8. Do you think you are meeting the nutritional requirements of your child?
Yes/No

9. Are you aware of calcium and iron rich foods?
Yes/No

10. Is your child a picky eater?
Yes/No

11. Which of the following does your child resist eating?

Milk and milk products # Non-vegetarian foods

Green leafy vegetables # All of the above

Fruits # None of the above

12. Is your child very fond of any of the following foods?

- Chips
- Carbonated drinks (Eg: Pepsi etc.)
- Fast foods (Burger, Pizza etc.)
- Chocolates

13. How is your child's appetite?

(I) Good (II) Can be better

(III) Poor (IV) Over eats

14. Are you aware that refined foods are not good for your child?

Yes/No

If yes, name some_____

15. Are you aware of the common nutritional deficiencies among children?

Yes/No

If yes, name some _____

16. Does your child have any nutritional deficiencies?

Yes/No

If yes, what _____

17. How often does your child fall sick?
(I) Frequently (II) sometimes (III) rarely

18. Does your child eat while watching TV?

Yes/No

PRACTICE QUESTIONS

19. Is your child involved in any extra-curricular activity?

Yes/No

20. Is it within the school or outside?

If within the school, do you pack an extra lunch?

Yes/No

21.What does the child eat after returning from school?

_____

22. Do you incorporate calcium and iron rich foods in your child's diet?

Yes/No

23. Do you give any nutritional supplements (Appetizers/Tonics) to your child?

Yes/No

24. Do you pack any packaged foods in lunch for your child?

Yes/No

If yes, what _____

25. Would you be interested in attending a nutritional awareness program pertaining to childhood nutrition?

Yes/No

AN OVERVIEW ON DENGUE FEVER: AN EMERGING PUBLIC HEALTH ISSUE

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Abstract

Dengue is an emerging public health concern not only in Asian subcontinent but also in remote areas of world secondary to increase in number of mosquitoes, congested living facilities & lack of personal hygiene. Annually, morbidity and mortality secondary to dengue has created significant public health concerns from a socio-economic standpoint which requires increased awareness to general public. In this case, we discuss a case of a patient who was diagnosed with dengue in urban India. Here we elaborate upon various systemic manifestations of dengue fever and also demonstrate the progression of this patient throughout the time course in hospital. In addition, we also elaborate on an interesting public health model that has been used to risk stratify areas affected with Dengue.

Key words: Dengue, Fever, Mosquitoes, Symoptoms

Introduction

Dengue is one of the most common mosquito-borne viral diseases. The first and second epidemics of Dengue haemorrhagic fever occurred in Manila in 1954 and 1956, followed by the third in Bangkok in 1958. Since then, Dengue has spread throughout tropical Asian countries and has expanded globally. Dengue virus belongs to the flavivirus genus of the Flaviviridae family. They are transmitted among humans by Aedes mosquitoes bite such as Aedes aegypti. There are four serotypes, namely Dengue type 1, Dengue type 2, Dengue type 3 and Dengue type 4. Infection with any of the four serotypes causes clinical symptoms that may vary in virus virulence, and host response. And recovery from one infection provides life- long immunity against that particular serotype. Dengue has its progression from Dengue fever, which is a simple form of dengue it may lead to dengue hemorrhagic fever, a condition which involves sensitive stomach, petechial, weak pulse, and internal bleeding that can lead to black vomit or faeces.

If dengue hemorrhagic fever is untreated it may progress to dengue shock syndrome, a worst form of dengue which can also result to death. Dengue fever is a multisystem disorder caused due to infection by Dengue virus which is an ssRNA virus belonging to a Flaviviridae family.

History of Dengue

The origins of the word dengue are not clear, but one theory is that it is derived from the Swahili phrase "Ka-dinga pepo", meaning "cramp-like seizure caused by an evil spirit". The Swahili word "dinga" may possibly have its origin in the Spanish word "dengue" meaning fastidious or careful, which would describe the gait of a person suffering the bone pain of dengue fever.

The first record of a case of probable dengue fever is in a Chinese medical encyclopedia from the Jin Dynasty (265 – 420 AD) which referred to a "water poison" associated with flying insects. The first recognized Dengue epidemics occurred almost simultaneously in Asia, Africa, and North America in the

1780s. The first confirmed case report dates from 1789 and is by Benjamin Rush, who coined the term "breakbone fever" because of the symptoms of myalgia and arthralgia.

The viral etiology and the transmission by mosquitoes were only deciphered in the 20th century. Nowadays, about 2.5 billion people, or 40% of the world's population, live in areas where there is a risk of dengue transmission.

Possible factors for dengue fever –

1. Unplanned urban overpopulation of areas leading to inadequate housing and public health systems (water, sewerage and waste management)

2. Poor vector control, e.g., stagnant pools of water for mosquito breeding

3. Climate change and viral evolution (increased virus transmission has been linked to El Nino conditions)

Dengue virus

Dengue is caused by dengue virus (DENV), a mosquito-borne flavivirus. DENV is a single-stranded RNA of the family Flaviviridae, genus Flavivirus. DENV causes a wide range of diseases in humans, from a self limited Dengue Fever (DF) to a life threatening syndrome called Dengue Hemorrhagic Fever (DHF) or Dengue Shock Syndrome (DSS).

There are four antigenically different serotypes of the virus (although there is report of 2013 that a fifth serotype has been found) –

- DENV – 1
- DENV – 2
- DENV – 3
- DENV – 4

Here, a serotype is a group of viruses classified together based on their antigens on the surface of the virus. These four subtypes are different strains of dengue virus that have 60-80% homology between each other. The major difference for humans lies in the subtle differences in the surface proteins of the different dengue subtypes.

Differential diagnosis based on symptoms is challenging due to dengue's non-specific symptoms such as fever, aches and fatigue that are often overlap with other endemic infections. Dengue-associated mortality can be reduced from 20–30% in severe cases to less than 1% with appropriate fluid replacement and supportive care, which is greatly facilitated by early diagnosis.

Dengue-A global issue:

Dengue is a major public health issue globally. It has been found that that, "...estimated that about 2.5 billion individuals, a staggering 40% of the worldpopulation, inhabit areas where there is a risk of transmission of DF (Dengue Fever) and that the disease burden has increased at least fourfold in the last three decades. Modelling also suggests that approximately 50–100 million human infections occur annually, of which about 500000 are

DHF (Dengue Hemorrhagic Fever)".

The global incidence of dengue fever and more severe forms of the disease was recently estimated at 96 million. Currently, the only available mitigation strategy is the attempt to interrupt transmission by vector control, though numerous investigations are underway to develop vaccines and other therapies aimed at preventing infection and limiting severe disease.

Signs and Symptoms

The disease has a sudden onset and symptoms may include

- fever for 3-7 days
- intense headache and pain behind the eyes
- muscle and joint pain
- loss of appetite
- vomiting and diarrhoea
- skin rash
- bleeding, usually form the nose or gums

Fig-1

Recovery is sometimes associated with prolonged fatigue and depression. Repeated episodes of dengue fever may result in excessive bleeding and appropriate treatment, are rarely fatal.

Diagnosis

The diagnosis of dengue fever is made by clinical presentation and a blood test.

Incubation period

It is the time between becoming infected and developing symptoms. It is usually 3-14 days, commonly 4-7 days.

Infectious period

It is time during which an infected person can infect others. A mosquito becomes infected if it bites an infected person while the person is having fever (average period of about 3 to 5 days.
After biting an infected person, it takes 8-12 days before the mosquito infects other people. The mosquito remains infectious for life. Dengue fever is not directly spread from person-to-person.

Prevention

- There is no vaccine to prevent human infection.
- Prevent access of mosquitoes to an infected person.
- Protect yourself from mosquito bites at all times.
- Use a repellent containing 20%-30% DEET (Diethyltoluamide) or 20% Picaridin on exposed skin. Re-apply according to manufacturer's directions. Avoid using DEET on young children.
- Mosquito traps and nets – nets treated with insecticides are more effective, otherwise the mosquito can bite through the net if the person is standing next to it. The insecticide will kill mosquitoes and other insects, and it will repel insects from entering the room.
- Wear neutral-colored (beige, light grey) clothing. If possible, wear long-sleeved, breathable garments.
- If available, pre-soak or spray outer layer clothing and gear with permethrin.
- Get rid of water containers around dwellings and ensure that door and window screens work properly.
- Apply sunscreen first followed by the repellent (preferably 20 minutes later).

Prevention is extremely important via early detection and reducing rate of transmission. Best prevention can be achieved by avoiding travel in endemic areas during monsoon when Dengue is the most prevalent.

Further reduction of transmission can occur via use of mosquito sprays multiple times a day in house to prevent harboring, stay in a well ventilated cold environment and wear mosquito repellent protection on skin with topical emollients like permethrin. Two common modes of transmission of Dengue are epidemic and hyper endemic dengue. In hyper endemic dengue, disease and vectors are always present in local area and viral strain circulates either seasonally or all year around in humid environment which leads to more infections. In contrast, epidemic dengue is an introduction of new strain brought on by an isolated transmission from area outside of infection which starts an infectious cycle amongst hosts. We believe this patient to be affected due to hyper endemic dengue.

However, due to increase global immigration, it is possible that dengue strains can become a widespread epidemic or even a pandemic. In terms of diagnosis NS-1 antigen test has been used extensively to assess the index of suspicion of Dengue fever. Study by Para-navigate ET. Al demonstrated rapid NS-1 antigen detection test to be extremely efficient in outpatient setting at bedside and had comparable sensitivity and specificity to NS-1 antigen capture ELISA. In addition, presence of NS-1 antigen is extremely important in predicting high clinical severity of disease. Recently, it has been found that NS-1 antigen induces pathogenesis by induction of interleukin. In addition; the symptom of “fever” has been proven to be the most significant predictor in terms of diagnosis for patients with Dengue infection and stratifying patients in low versus high risk.

Addition, it is important to rule out disorders like chikungunya which has similar presentation but has the hallmark of bone breaking fever without pancytopenia. With

Growing incidence of Zika virus in US (which is also transmitted by A. Egypt), Dengue and Chikungunya should always be considered in clinical decision making

Report on Telangana

Southern part of India is pivotal for several viral diseases, amongst which the DENV tops the list. Recurrent dengue outbreaks were experienced by South Indian states such as Telangana and Andhra Pradesh with increased disease severity, but regarding circulating serotypes, very few studies are available. DENV-3 and

DENV-4 were reported from Hyderabad during the outbreak of 2007; however, the circulation of all four serotypes was noted in the same place during 2014.

The first confirmed report of dengue infection in India dates back to 1940s, and since then more and more new states have been reporting the disease in epidemic proportions often inflicting heavy morbidity and mortality Kolkata in India was the first to witness the epidemic (1963), but many more regions from the country reported the same in different time frames, Visakhapatnam (1964), Vellore (1968), Ajmer (1969), Kanpur (1969), Jalore (1985), Chandigarh (2002), Mumbai (2004), Ludhiana (2007), New Delhi (1996, 2003, 2006, 2010), Chennai (2006-2008) and Kerala (2008).

Treatment:

Increased oral fluid intake is recommended to prevent dehydration. Supplementation with intravenous fluids may be necessary to prevent dehydration and significant concentration of the blood if the patient is unable to maintain oral intake. A platelet transfusion is indicated in rare a case if the platelet level drops significantly (below 20,000) or if there is significant bleeding. People who suffer from dengue fever have no risk of death but some of them develop Dengue Hemorrhagic Fever (DHF) or Dengue Shock Syndrome (DSS). In some of these cases death can occur. If a clinical diagnosis is made early, a health care provider can effectively treat DHF using fluid replacement therapy. Adequately management of DHF generally requires hospitalization.

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	Fever	Rash	Conjunctivitis	Joint pain(arthralgia/ myalgia)	Sign of sepsis(haemorrhage/ shock)
Zika		+	+		
Chikangunya	+			+	
Dengue	+	+			+

Fig-2

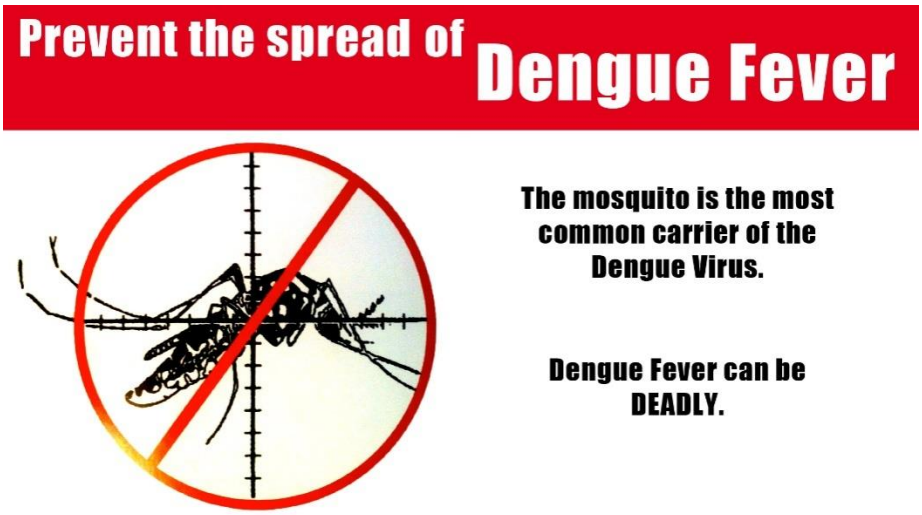

Fig-3

REPORT ON TELANGANA

Southern part of India is pivotal for several viral diseases, amongst which the DENV tops the list. Recurrent dengue outbreaks were experienced by South Indian states such as Telangana and Andhra Pradesh with increased disease severity, but regarding circulating serotypes, very few studies are available. DENV-3 and DENV-4 were reported from Hyderabad during the outbreak of 2007; however, the circulation of all four serotypes was noted in the same place during 2014.

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In a major health scare, 700 new cases of dengue, including 23 from Hyderabad, were reported from across the state in just a fortnight. While thousands of patients have landed in hospitals, 46 cases of dengue were reported on Sunday, mostly from Khamman and Warangal last year.

The number of dengue cases went up from 1,121 on August 30 to 1,816 on September 15, according to records maintained by National Vector Borne Disease Control Programme. While 2,560 cases were reported between January to October 5 of 2018, 1,587 cases were reported during the same period in 2017, an increase of 973 cases.
According to statistics available with the State Health department -- Khammam, Hyderabad, Adilabad, Peddapalli and Bhadradri Kothagudem, continue to be the highly affected districts in the State.

Most of the cases have been reported during the periods of August – October. Most of them occurring during the month of June to September depict the role of rainy season in the study conducted by

Kashinkunti et al, fever was the most common symptom found in all the patients followed by headache (83.1%), Myalgia (77.3%), retroorbital pain (74.7%). Hypotension was found in 86.5% of the patients. Thrombocytopenia, leucopenia and bleeding manifestation were found in 84.0 %, 84.8% and 58.8% patients respectively. Study conducted by Kashinkunti et al, found the most common presentation was fever 100 (100%), followed by headache (90%), myalgia (81%), vomiting (56%) and abdominal pain (48%).

Discussion:

Dengue based fever can successfully recovered in 2 weeks by secondary to aggressive hydration therapy and preventative measures. Clinical presentation of Dengue can vary from being asymptomatic to very severe presenting as fever, joint pain, muscle aches, skin rash characterized by erythematic and warmth, narrow pulse pressure and delayed capillary refill. Minority of patients end up progressing to a more severe form of shock or hemorrhagic fever which includes additional hematological manifestations like pancytopenia bleeding and severe hypotension is secondary.

Images are used to demonstrate a characteristic rash with red discoloration with the upper and lower extremities. Rash is used clinically to ensure remission of patient from dengue fever after initiation of treatment.

Conclusion:

Studies have established that around 80% of dengue virus infection come from individuals who have mild or no symptoms of dengue, but are carriers, meaning that many more cases might be going unreported. The fact that people with no symptoms of dengue could be carriers was found in a study conducted in the year 2017 by the US-based University of Notre Dame.

Scientists are investigating the mechanisms by which the dengue virus causes disease by focusing on understanding dengue pathogenesis, the virus itself, and vector biology. Researchers also aim to improve diagnostics for patients with dengue so that they can receive effective treatments sooner. In addition, by improving surveillance of dengue cases and mosquito vectors, researchers hope to reduce the effect of dengue epidemics.

Control measures:

1. Use of Mosquito Repellents.
2. Wearing Protective Clothing.
3. Avoid mosquito-attracting smells.
4. Using mosquito deterrents in the home.
5. Avoid breeding grounds.

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ECOLOGICAL STUDY REPORT ON MUSI RIVER

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Abstract: *It is the tributary of Krishna River in the Deccan Plateau which flows through the state of Telangana. It was known as Muchukunda River in earlier days. Hyderabad stands on the bank of this river which divides the city between the old and the new. The river originates in Ananthagiri Hills near Vikarabad. The Purana Pul is the oldest bridge over the river in Hyderabad. Himayat Sagar and Osman Sagar are the two dams which are constructed over the river. It rises in the Ananthagiri hill in Ranga Reddy district. Vikarabad is the birthplace of Musi. The Purana Pul was constructed in 1579 A.D.during the reign of Ibrahim Qutub Shah. On 28 September 908, Musi River was the reason for the devastating floods in Hyderabad.*

Key words: Musi River, Pollution, Floods, Degradation

Introduction:

There is hardly any water flowing into the Musi. The water flows downstream very quickly during rainy seasons. Water can be seen only at the kath was or at the reservoir at Suryapet. Whatever the water that is found in the riverbed in the form of a small stream is actually the sewage /drainage from Hyderabad city. Large parts of the urban area do not have underground sewer systems. Either the settlements have septic tanks which are not the preferred system of disposal from a long term perspective or the sewer lines are combined with the storm water lines. Thus many natural storm water drains have been actually carrying domestic sewage into the river.Several villages downstream of the city along the Musi irrigate their fields with the water (ie. a cocktail of industrial effluents plus domestic sewage) from Musi river. Such “water” is diverted from the kathwas into the village irrigation tanks which in turn is used for cultivating crops. Several such village tanks are perennial in nature i.e. they are never dry due to the regular flow of the cocktail from Hyderabad. Underground water in such villages is polluted beyond acceptable standards. People from several such villages travel as much as 10-15 km to reach the outskirts of Hyderabad city to collect drinking water in plastic cans.

Fig-1

Current Situation:

The river has become a dumping site for domestic and industrial waste because of lack of planning and impartial urbanization. It was once the mighty river which has become a dumping giant now. The river is dying a slow death affecting the health of the citizens. As it passes through Hyderabad, it converts into a giant sewer. Years of neglect has made the river to come among the most polluted rivers in the country. Crores of Rupees has been spent for treating it but no progress has been seen.

Fig-2

Fig-3

Pollution caused by the River to the nearby Citizens:-

The polluted water cause the water pollution as sometimes it makes the drinking water stagnant. Due to the over dumping of garbage and industrial wastes into the river makes the river water polluted. Due to indiscriminate urbanization and lack of planning, the river has become a receptacle of untreated domestic and industrial waste dumping out of Hyderabad. It is estimated that nearly 350 MLD (million liters a day) of polluted water and sewage originating from Hyderabad and Secunderabad flow into the river. Efforts to clean it have failed. The river water downstream of the cities remains highly polluted, considered a major disaster in Hyderabad.

Fig-4

Flora & Fauna Seen in the River:

Mostly seen fauna are the wild Dogs, Pigs and Buffaloes, which pollute the river water even more. There is no aquatic life as it is said by the GHMC members that "If it was clean water that was stagnant, there would be no problem. There is no aquatic life here .Now the water stagnates at multiple locations and it has become a breeding ground for mosquito's .Where as in case of flora there are only wild plants which are seen over here and few migratory birds are seen.

Fig-5

Flood Devastation:

The Musi River was the cause of frequent flood devastation of Hyderabad city until the early decades of the 20th century. On Tuesday 28 September 1908, Hyderabad witnessed disastrous floods of the River Musi, flowing through the city. In one day, 17 inches of rainfall was recorded and the water level at Afzalgunj was about 11 feet (3.4 m) high. These floods caused huge devastation to Hyderabad and killed around 15,000 people.

The modern era of the development of the twin cities began soon after these floods in 1908. This necessitated planned, phased development.

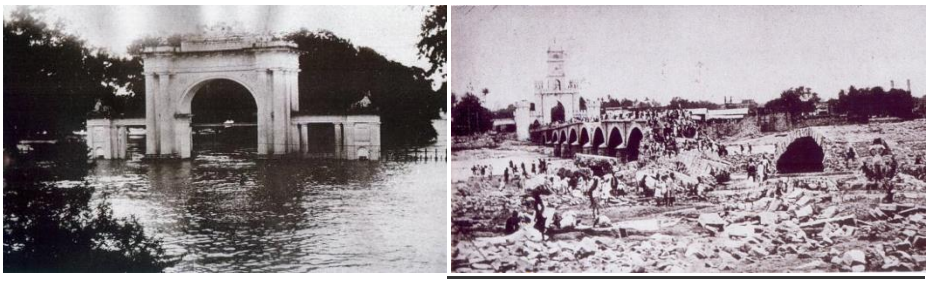

Fig-6

Damages due to Floods:

The **Great Musi Flood** was a devastating flood that occurred on 28 September 1908 in the Hyderabad state capital on the banks of Musi river. The flood, locally known as *Thughyani Sitambar*, shattered the life of the people living in Hyderabad, killing 50,000 people. It washed away three bridges — the Afzal, Mussallam Jung and Chaderghat — the Puranapul became the only link between two parts of the city.

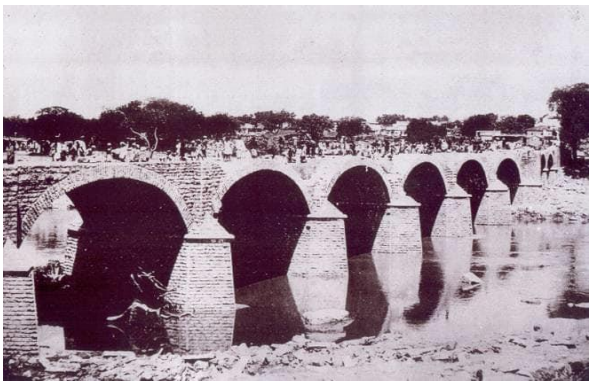

Fig-7

Present Condition:

It is not know exactly when Musi dried up as a river. But interviews with people and information collected from secondary sources indicate four major reasons which have led to no water flowing in Musi:

1. Degradation of the catchment of Musi in the upstream in Viakarabad area.

2. Impounding of water by the Osmansagar and Himayatsagar, and degradation of their immediate catchment areas.

3. Changes in the drainage pattern of Hyderabad urban region affecting free flow of water into the Musi from various directions.

4. Disruption of the interlinkages of the numerous water tanks in the region (numbering more than 1000) and their encroachments overtime, which were otherwise feeding the river.

Beautification / Conservation of Musi River:

Any development or redevelopment plan for Musi affects a number of people/stakeholders especially related to housing, livelihoods, and physical environment. Implementation of most of the plans prepared or being undertaken would involve eviction of people living within the banks of Musi (owners and squatters), and also those living on the banks (owners and squatters). This leads to displacement of houses which affects the work and livelihoods. It is, therefore, important to understand the ground level situation and have a consultative process for planning and implementation. Any physical intervention also has to take care of the heritage of Musi River, its embankments and the various structures located around it. There are heritage regulations which give guidelines for development and in some cases restrict development. Conserving Musi and restoring its past glory would also involve extensive heritage conservation.

Dicussion:

As the city of Hyderabad has grown in size and is emerging as a global megacity, its water resources have been neglected to the detriment of long-term water security of the people. With the old sources declining and the demand for water growing, the city is drawing water from longer distances. The Musi River has been reduced to a sewer drain carrying the domestic and industrial waste generated in Hyderabad city. This had an adverse impact on the river ecology and the villages in the downstream of the river.

Conclusion:

The future water security of Hyderabad city lies in an integrated management of the entire catchment area of the Musi River and a number of water bodies that still exist in and around the city.

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An Experimental Study on Phototactic Behaviour In Cockroaches

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Abstract:

Organisms can respond not just to the direction of light but also to its intensity. Typically, phototactic movement allows organisms to maintain optimal physiological and growth conditions. Certain defensive behaviours, especially those of insects, are also considered to be forms of phototaxis. Phototactic responses are mediated by photoreceptors, which are highly specialized, light-sensitive cells containing photo pigments. Negative phototaxis can be observed in Cockroaches, they Fear Light. Although some species do prefer to live in dark, quiet areas, some cockroaches love the light as much as we do. They'll gather near windows or on television screens at night. Most of the time, cockroaches run because they fear the light

Introduction:

Phototaxis is a kind of taxis, or locomotory movement, that occurs when a whole organism moves towards or away from stimulus of light. This is advantageous for phototrophic organisms as they can orient themselves most efficiently to receive light for photosynthesis. Contrary to popular belief, cockroaches are not afraid of light. Although most species do prefer darkness, some are actually attracted to light and can be found gathering near windows or on television screens at night. Most of these nocturnal insects will scatter when a light is shone upon them

Light provides many organisms with both energy and information about their surroundings, which is why these organisms commonly display motile responses to light. Such movements of motile organisms or free plant parts in response to light stimulation are called phototaxis. Movements directed toward or away from sources of light are further described respectively as positive or negative: A moth's flight toward a shining lamp is an example of positive phototaxis, whereas the tendency of a ciliate cell to swim toward darker waters exhibits negative phototaxis. Different species and tissues can vary in their complements of photoreceptors, which is part of why photo tactic responses differ as well. Retinals are key carotenoid molecules involved in the vision of animals, including vertebrates, arthropods, and molluscs; flavins, including riboflavin (vitamin B_2), allow phototaxis in algae and plants; tetrapyrrole compounds provide photosynthetic bacteria with the means for orienting themselves to most efficiently receive the light that

they convert into energy; and phytochromes are another type of protein pigment used by plants and other photosynthetic organisms to detect light, especially in the red and far-red regions of the visible spectrum

Materials required: One wooden box with a partition creating four smaller chambers, soil, live cockroaches, torch bulb fixed in one of the chamber of the box.

Procedure : The partition wooden box has two sides A and B ,fix a small bulb inside A , spread soil on both sides , they should not get inside the soil ; leave equal number of cockroaches in both sides . They should have small gateways for cockroaches to move from one side to the. Close the box. Turn the bulbs on for 60 mins. Open the box and count the number of cockroaches on each side. More number of preference of cockroaches that is, if they are more on the light side, they are photopositive. If they are more in the dark side, they are photonegative.

The same experiment can be repeated by changing the colour, intensity and temperature of the bulb

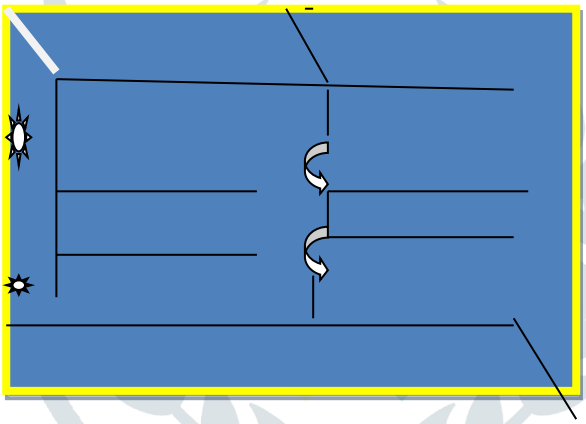

Fig-A: *wooden box with a partition*

Results :

Situation 1

The bulb in dim and cold

Number of cockroaches in chamber A = 02

Number of cockroaches in chamber B = 08

Situation 2

The bulb is little bright and warm

Number of cockroaches in chamber -A = 01

Number of cockroaches in chamber- B = 09

Situation 3

The bulb in bright and little hot

Number of cockroaches in chamber - A = Nil

Number of cockroaches in chamber -B = 10

Situation 4

The bulb is red or blue

Number of cockroaches in chamber - A = Nil

Number of cockroaches in chamber - B = 10

Interpretation:-

1. It was observed that cockroaches were moving away from the light source , hence they are photonegative
2. More number of cockroaches in particular chamber , they are photo- negative
   Less number of cockroaches in particular chamber, they are photo-positive.

Fig – B ,C showing experimentation in different situations

Results & Discussion:

The experiment was conducted under different situations in two chambers A &B by changing the intensity of the bulb.

In situation-I, the bulb is dim & cold in chamber 'A' whereas the chamber 'B' is dark. Number of cockroaches in chamber 'A' is 2 and chamber 'B' is 8 i.e, photonegative affect was observed as there was movement of 2 cockroaches in chamber 'A'.

In second situation the bulb is little bright and warm because the intensity of the bulb was slightly increased only one cockroach is seen in chamber 'A' and in chamber 'B' is 9.

In third situation, the intensity of the bulb was still increased. It is brighter and hot .Number of cockroaches in chamber 'A' is nil whereas in chamber 'B', it is 10.

In fourth situation, the intensity as well as the colour of bulb is changed to red or blue, it was observed that chamber 'A' has nil cockroaches and chamber 'B' has 10.Therefore it was observed that by changing the intensity and colour of light, we can know the photonegative or photopositive nature of the animal.

Conclusion: It is concluded that, as the cockroaches are moving away from the light indicates that they are photonegative in behaviour.

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IMPORTANCE OF ELECTRICAL CONDUCTIVITY AND pH OF SOIL IN PREDICTION OF PADDY PRODUCTION

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Abstract: Agriculture soil samples were collected from different places of Telangana and Andhra Pradesh. The soil samples at 0-5cms, 0-10 cms0-15cms were collected at different sampling points. [4]pH, conductivity, [2]colour of the soil, crystalline amorphous [3]nature of soils were determined. From the results of this study, the PH of the agriculture soils is ranging between 6.5 to 8.38 which enhances that soil is in alkaline in nature. The electrical conductivity of soil samples was varied between0.1mS/cm to 2.3mS/cm.

Keywords: *Agricultural soil, Electrical conductivity*

I. INTRODUCTION

Soils are highly heterogeneous in their properties and they become complex due to changes in tillage, liming and fertilizer amendments. These heterogeneous properties of the soil are responsible for the production of crop. Apart from spatial variation there is a variation in nutrient status and moisture. The variation in soil properties implies that soils have varying capacity to retain and supply the nutrients to rice crop. It is a challenge to the cultivators and farmers to manage input field applications.

Currently agriculture inputs such as seeds, fertilizers, irrigation and pesticides are evenly applied but yield varies from place to place. It is logical and economical to set scientific, site specific or precision farming practices.

It is widely used technique in advanced countries but it is not seen in paddy soils in Andhra Pradesh & Telangana. [1]This study focuses to apply the soil electrical conductivity and pH measurements so that rice farmers can benefit for precise fertilizer application and to improve the productivity of farms.

The electrical conductivity of soils varies depending on the amount of moisture held by soil particles. Sands have a low conductivity, silts have a medium conductivity, and clays have a high conductivity. Consequently, electrical conductivity correlates strongly to soil particle size and texture.

A pH will tell whether your soil will produce good plant growth or whether it will need to be treated to adjust the pH level. For most plants, the optimum pH range is from 5.5 to 7.0, but some plants will grow in more acid soil or may require a more alkaline level.

Topography

The city lies in Deccan Plateau and rises above an average height of 536m. Rocky and hilly regions are under obliteration for urbanisation. Grey and Pink granites are among world's oldest geographically it is located in the northern part of Deccan plateau, on banks of river musi. It is a sloppy terrain. The city's soil is red sandy with areas of black cotton soil.

2. Objectives of the Study

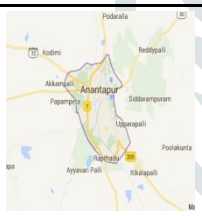
- To find the pH of the soil sample collected.
- To find the conductivity of soil sample collected.
- By knowing the pH and conductivity of soil suitable suggestion are given.
- Regarding the type of fertilizer pesticide to be used.
- Suggestions also can be given about the type / variety of the plant to be introduced in to the field.

3. Research methodology

3.1 Site selection

Paddy fields in Telangana areas & Andhra Pradesh are selected. Random and grid sampling techniques are used to collect soil samples. It has same climate and uniform temperature throughout the area. Soil samples collected from Rangareddy,Sangareddy, Nalgonda,Mahaboobnagar, Anantapur,Vijayawada and Godavari districts.

Table 1:Sample collection areas

Soil collected area	Map	Geography	Climate	Population 2001-2011
Rangareddy		A fresh water reservoir, called Osman Sagar, Himayath Sagar, on the riverMusi at Gandipet is the prime drinking water source to the capital city of Hyderabad.	District is characterized by a hot summer and is generally dry except during the South west monsoon season	3,575,064-5,296,741
Sangareddy		Medak district occupies an area of approximately9,699 sq km comparatively	The climate of Hyderabad remains fairly warm through most parts of the year	2,670,097-3,033,288
Mahabubnagar		The city is located at a distance of 98 km from Hyderabad 108 km from Kurnool and 105 km from Raichur	The climate here is tropical.	3,513,934-4,053,028
Nalgonda		Nalgonda district occupies an area of approximately 14,200 sq km, comparatively equivalent to Indonesia's Flores.	May being the hottest month, the mean daily maximum temperature is about 40 degree Celsius and the mean daily minimum is about 28 degree	3,247,982-3,488,809
Anantapur		It is the largest district of Andhra Pradesh spanning an area of 19,130 square km (7,390 sq mi Six rivers flow within the	Anantapur has a semi-arid climate, with hot and dry conditions for most of the year.	3,640,478-4,081,148
Vijayawada		It lies on the banks of Krishna River and is also surrounded on the north by Budameru River. .	Vijayawada has a tropical climate with hot summers and a monsoon season.	1,034,358-2011
West godavari		The district occupies an area of 7,742 km^2 (2,989 sq mi).	The summers are very hot and dry while the winters are fairly pleasant.	3,803,517-3,936,966

3.2 Soil Sampling and Analyses

A total of 24 soil samples were collected across the three sampling points, soil samples were collected at depths of 5cm, 10cm, and 15cm, packed in a labelled polythene bag and electrical conductivity and pH of soil samples were tested. The analysis of electrical conductivity is carried out for three times to validate the experimental data to avoid errors highest level of significance is determined.

Soil PH is an indication of the acidity or alkalinity of the soil and it is measured in PH units. Soil PH is defined as the negative logarithm of the hydrogen ion concentration. The PH scale ranges from 0 to 14 with PH=7 as the neutral point. As the amount of hydrogen ions in the soil increases the PH decreases indicating the acidic nature and from PH 7 to 14 the soil increasingly more alkaline or basic.

The electrical conductivity is the property that has a material to transmit or conduct electrical current (1-12). The apparent soil conductivity is a measure of the bulk electrical conductivity and it is influenced by porosity, concentration of dissolved electrolyses texture, quantity and composition of colloids organic matter and water content in soil.

Hyderabad is a common capital of Telangana and Andhra Pradesh. It has a population of 6,809,970. It is the fourth biggest city in India. It is the fourth biggest city in India. It is governed by Greater Hyderabad Municipal Corporation (GHMC). It has an area of 650sq.kms. The topography of the city is sloping rocky terrain of grey and pink granites. It has a unique combination of wet and dry climate that borders hot-semi arid climate. The city lies at 17.366ºN and a attitude of 78.476 Eº longitude. Most of rain will be received by south-west summer monsoon and it falls between June and September. This city is polluted heavily by industrial, vehicular activities. Taking that factor into consideration, present study has been carried out to analyse the characteristics of soil samples.

Soil Type

The soils of the district are mainly 'red earth's' comprising loany sands, sandy loans and sandy clay loans. In the areas of flat topography and along the river Krishna and its tributaries, regur or black cotton soil is found.

Table 2: topography of soils

AREA	LATITUDE &LONGITUDE	SOIL TOPOGRAPHY	GROUND WATER
Rangareddy	17° 20' N 78° 30' E	Red soil predominates in the district followed by Black Cotton soils.The Mandals where more than 50 percent of the villages have Red-Chelka soils.The soils are predominantly black .	The depth to water levels observed during pre-monsoon (2011) season are between 1.4-33.50m.
Sangareddy	18° 03' N 78° 18' E	The ground is mostly of plains, gentle slopes and undulating hills The elevation of the ground in the district is between 500m - 600m with occasional hills up to 638 m above Mean Sea Level.	The Ground water resources available in the district is 1,05,038 ha.m and the utilisation is 88,700 ha.m and projection for dosmestic and industrial requirement for (2025) is 7,793 ha.m.
Mahaboonagar	16° 42' N 77° 58' E		Available ground water resource in the district is 390.78 MCM in command area and 1039.44 MCM in non-command area of the district.
Nalgonda	17.1883° N, 79.2000° E	The soils of the district are mainly 'red earth's' comprising loany sands, sandy loans and sandy clay loans. In the areas of flat topography and along side the river Krishna and its tributaries, regur or black cotton soil is found	The ground water occurs under water table condition alluvial formations along the River Aler. The depth of the dug well ranges from 3 to 6 m
Anantapur	14° 41' N 77° 39' E	Most of the soil at Anantapur district is Red soil. Exceptions for some mandals where red and black soils occur in almost equal proportion.	It is about 1100 feet at Anantapur and the lowest 900 feet is at Tadipatr.
Vijayawada	16° 31' N 80° 39' E	Among the various mineral resources occurring in the area, the chief resources are gold, diamonds and asbestos. There are however no large sized minerals occurring in the district	The Krishna River is the fourth biggest river in terms of water inflows and river basin area in India, after the Ganges, Godavari and Brahmaputra. The river is almost 1,300 kilometres (810 mi) long. The river is also called Krishnaveni.

West godavari	16° 35' N 82° 15' E		Ground water resource estimation, the total net ground water availability in the district is of the order of -138590 ha.m and the existing ground water draft for all uses is 49424 ha.m

Sample picture 1

Sample picture 1

3.3 Standard Methods

The conductivity, PH, colour intensity of the soil samples were determined by using digital conduct meter, PH meter and colorimeter.

Reagents

Distilled or deionised water,The water is to have an electrical conductivity of <1 µS/cm and have a CO2 concentration not more than atmosphere equilibrium.0.01M Potassium Chloride, Reference Solution Buffer tablets pH 4.1, pH 9 & pH4.

Procedure

pH meter is used to measure the acidity or alkalinity of water. The negative logarithm of [H^+] ion concentration is termed as pH. The pH of soil sample is determined by using Elico pH meter.When the pH meter calibration is done, the electrode is rinsed and placed in the sample and noted pH measurement. Soil sample which is of soft soil of 25 gms take in a beaker and add some water so that soil is slurry then dipped pH electrode and noted the pH measurement .Here we have measured pH 7 pH9 and pH4, so firstly we measured in pH7 and followed by pH9 and pH4.The results are almost alkaline medium and few are in neutral medium.

Potentiometer measurements

pH metry measurements

Table 3. Measurements of pH & Conductivity

Agriculture soil conductivity and pH					
Rangareddy					
Level	colour	conductivity	pH7	pH4	pH9
Surface	Redddish brown	0.8	7.69	7.5	7.75
5cm	Redddish brown	0.9	7.38	7.32	7.5
10cm	Redddish brown	1	7.32	7.32	7.56
Sangareddy					
Surface	Redddish brown	1.4	6.8	6.5	6.9
5cm	Redddish brown	1.3	6.91	6.9	7.23
10cm	Redddish brown	1.9	7.02	7	6.92
Mahaboonagar					
Surface	Dark brown	0.8	7.25	7.16	8.17
5cm	Dark brown	0.4	7.36	7.26	8.34
10cm	Dark brown	0.2	7.14	7.12	8.4
Nalgonda (Ramanapet)					
Surface	Dark brown	0.2	7.12	6.97	7.91
5cm	Dark brown	0.5	7.35	7.26	8.13
10cm	Dark brown	0.2	7.33	7.26	8.09
Anantapur					
Surface	Redddish brown	0.2	7.36	7.26	8.38
5cm	Redddish brown	0.2	7.7	7.52	8.22
10cm	Redddish brown	0.1	7.36	7.23	8.22
Nalgonda (Chityal)					
Surface	Dark brown	0.3	7.35	7.25	8.15
5cm	Dark brown	0.1	7.37	7.26	8.12
10cm	Dark brown	0.2	7.37	7.27	8.14
Nalgonda (Marriguda)					
Surface	Redddish brown	1	6.4	6.36	7.12
5cm	Redddish brown	0.5	7.56	7.5	8.36
10cm	Redddish brown	0.5	7.52	7.5	8.35
Vijayawada					
Surface	Dark brown	1.4	7.4	6.93	7.96
5cm	Dark brown	2.3	7.5	7.01	8.01
10cm	Dark brown	2	7.5	7.04	8.03
West Godavari					
Surface	Redddish brown	0.2	6.1	6.8	7.3
5cm	Redddish brown	0.2	6.2	6.8	7.2
10cm	Redddish brown	0.3	6.2	6.9	7.2

4. Results and discussions

The electrical conductivity of Rangareddy soil samples is ranging between 0.8-1.0 dS/m units. The salt in such type of soils is in between 0- 0.13gms/100gms and the soil is highly sensitive. The soils are non saline in nature. The value of electrical conductivity is slightly increased but there is no prominent change with respect to the depth of soil. Water is absorbed but nutrient by the roots is not possible as the salt ions are unequally distributed in the root environment of plants. The low conductivity may have resulted due to low cation exchange capacity and it has low organic content. The electrical conductivity variation is not observed and there is no correlation between the soil samples from surface to depth.

The pH of soils indicates the neutral nature of soils and it is not varying with depth of the soils and it is constant. The colour of soil is brown and indicates the composition of soil.The reddish brown colour of the soil indicates the presence of high organic matter and drainage capacity of the soils is very less.

The Sangareddy soil samples have conductivity greater than 1dS/m and it is increasing from surface to depth. The variation of 0.5 units is observed. Similarly the pH of soils is increasing with the increase in the depth of the ground. The reddish brown colour of soils indicate the presence of hydrated ferric oxide FeO ½ H_20 and drainage capacity of soils is very less.

Vijayawada paddy field agriculture soil samples have conductivity 1.4 dS/m and it is increasing from the surface to depth. The variation is approximately 1 dS/m. As conductivity variation is large the soil is more saline in depth than surface of the soil. Soil science of America has lowered the boundary between saline and non saline soils to 2 dS/m in the saturation extract. As conductivity is more in depth soil is slightly saline in nature Soil salinity is high indicates excess nitrogen based fertilizer or a high level of exchangeable sodium soils with an accumulation of exchangeable sodium are often characterised by poor tilth and low permeability making them unfavourable for plant growth.

The pH of the soil is 7.01pH from surface to depth soil pH is 8.03 pH. The pH of surface soil is neutral as depth is increasing it is changing to basic. The soil alkalinity is associated with the presence of sodium carbonate or washing soda (Na2CO3) in the soil The concentrated organic nitrogen fertilizers that can be used to lower soil pH by small amounts or by growing the crops like neutralises the soil pH. The colour of soil is dark brown it indicates that soil has a high organic matter content.

The electrical conductivity of West Godavari is ranging between 0.2 dS/m to 0.3 dS/m. The variation of conductivity is very less from surface to depth of the soil. Soil is saline free, due less amount of salinity in the soil productivity of rice is very less, instead of of growing rice crop by growing commercial crops like beans, corn (maize) (zea mays), carrot, Onion *(Allium cepa)* productivity increases The soil is black loamy soil .The black colour of the soil has a high organic matter content .Manganese oxide causes a black colour to the soil. Potassium was more required for the plants than calcium and magnesium.

The pH of the soil is ranging between 6.1 – 7.3pH from surface to depth of 15 cms. Surface of the soil slightly acidic in nature, the plants like cauliflower radish, tomatoes, onions, beans, cabbage grow well in this pH range.

The Mahabubnagar soil samples have conductivity 0.8 dS/m for surface layer of the soil as the depth is increasing the soil conductivity is 0.2 dS/m, variation of 0.6 dS/m is observed. The soil is non saline in nature. The colour of soil is Dark brown it indicates that soil has high organic matter content.

The pH of the soil on the surface of soil is 7.12 pH which is neutral in nature as depth is increasing soil pH is8.4, which is alkaline in nature. Soil with excessive alkaline nature reduces soil productivity

Soil alkalinity is associated with the presence of sodium carbonate or washing soda (Na_2 CO_3) in the soil, either as a result of natural weathering of the soil particles or brought in by irrigation water.

To reduce soil pH ammonium based fertilizers are major contributors to soil acidification. Ammonium nitrogen is readily converted to nitrate and hydrogen ions in the soil. If nitrate is not taken-up by plants, it can leach away from the root zone leaving behind hydrogen ions thereby increasing soil acidity.

Other alternate method to reduce the soil pH is growing other vegetables that can tolerate a soil pH of 7.5 include garlic and beets ,While garlic benefits from being planted the season before, beets can be planted early in the growing season for an early fall harvest. Asparagus, while not grown below ground, is one of the few plants that can tolerate alkaline soil, with a tolerance up to pH

The electrical conductivity of soil samples of Nalgonda district Marriguda village is ranging from 1 dS/m to 0.5 dS/m from surface to depth. Soil is non saline in nature. The colour of soil is reddish brown in colour this indicates that red colour is due to the free iron oxide coating and other mineral particles.

The pH of soil is 6.36 pH on the surface which is slightly acidic in nature as the depth of the sol is increasing soil pH is increased to 8.36pH which is basic nature. Sub soil is alkaline in nature which reduces crop productivity by adding compost, manure, or organic soil amendments like alfalfa meal to the soil can help drop pH over time by increasing bacterial population's sawdust, composted leaves, wood chips, cottonseed meal, leaf mold and especially peat moss, will lower the soil pH.

The electrical conductivity of soil samples of Nalgonda district chityal village is ranging from 0.3 dS/m to 0.2 dS/m from surface to depth it is not varying with depth of the soils and it is constant The EC is low indicating that solution does not conduct electricity well. The soil is having more percent of sandy type and less amount of clay, the cation exchange capacity decreases for sandy soils .*Cation exchange capacity* is related to percent of clay and organic matter. As the percent of clay and organic matter increase, the *Cation exchange capacity* also increases.

The pH of the soil is7.25 pH as the depth increasing the pH is 8.15. Sub soil is alkaline nature The pH is changing to basic in nature, it is not good to grow many plants at this pH range .By adding sulfur and aluminium sulfate, soil additives containing sulfur-coated urea can increase the acidity of soil over time (lowering its pH). As an additive, urea is fairly quick-acting, producing some effects as soon as a week or two after being introduced to the soil. Sulfur-coated urea is a common ingredient in many fertilizers.

Anantapur soil electrical conductivity is 0.2 dS/m on the surface layer of soil and it is 0.1 dS/m at 15 cms depth of the soil .Salinity of the soil is to low to grow rice crop, to grow rice crop in high yield electrical conductivity should be 3 – 2 dS/m is required. Instead of increasing salinity of soil growing commercial crops gives yield better .

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Food Sanitation and Hygiene Practices among Food Vendors (PaniPuri and Idli/ Dosa Bandis) in Hyderabad

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ABSTRACT

The rapidly growing and changing food demands by urban dwellers has resulted in the need for cheaper and convenience foods. Good sanitation and hygiene practices are extremely necessary measures to ensure the safety of food from production to consumption. Street vended foods have shown epidemiological links with illness(.1) Concerns have also been raised about these foods with respect to their potential for food poisoning outbreaks. The study sought to assess aspects of hygiene practices such as food preparation area, environment of food vendors, personal hygiene, handling and storage of food. A standardized questionnaire was used to collect information regarding knowledge and practices of food hygiene and sanitation practiced by street food vendors Food can become contaminated at any point during slaughtering or harvesting, processing, storage, distribution, transportation and preparation. Lack of adequate food hygiene can lead to foodborne diseases and death of the consumer.The street food industries play a very important role in the lives of urban dwellers residing in the developing countries. From the present study it was found that the food handlers could be aware of the need of personal hygiene but they fail to understand critical aspects of it such as cleaned cooking surfaces, wearing of head gear and apron, chipped nails, and deliberately avoiding usage of gloves. Food borne illnesses can be prevented if the food vendors improve their knowledge on **food safety** and also strictly follow hygiene practices.

KEYWORDS:

Contamination,Foodborne diseases, Hygiene, food handler, Food safety, food preparation

INTRODUCTION

The rapidly growing and changing food demands by urban dwellers has resulted in the need for cheaper and convenience foods. Good sanitation and hygiene practices are extremely necessary measures to ensure the safety of food from production to consumption. Street vended foods have shown epidemiological links with illness(.1) Concerns have also been raised about these foods with respect to their potential for food poisoning outbreaks.

Street vended food is ready-to-eat food that is sold at the corner of the street, fairs, commercial areas, and other public places. These foods are either prepared at home and sold or directly prepared at the street and consumed without further preparation. These includes food both vegetarian and non-vegetarian like chicken, meat, fish, pulses, wheat, fruits, vegetables, fruit juices, frozen food, beverages etc that are sold by the vendors at the streets or any other public place. (5)The food can be consumed when purchased without any further preparation and can be carried out and eaten elsewhere. In most of the developing countries street foods are a very important part of millions of people's life. The street food industries play a very important role in the lives of urban dwellers residing in the developing countries (4). These street foods are consumed by majority of the population in these countries. For drinks, meals, and various other food commodities these urban dwellers depend mainly on the street food which increases the worldwide interest on the importance of concern for food safety and health. (3,4)

The incidence of the food borne diseases is drastically increasing in both developing as well as the developed countries. Every year, millions of people worldwide are suffering from the food borne illnesses. Illnesses caused due to the consumption of contaminated food have been consistently increasing in the past few years. This has become one of the most important aspect of concern in the public health problems of the contemporary society. There is a noticeable increase in the number of food vendors in past few years due to the increased unemployment, dwindling economy, and the demand of street food by the urban dwellers needing the cheaper food. There are three main categories of street vendors. First the mobile vendors, ones who keep on moving from street to street on either bikes or vans and sell the food. The second are the semi mobile vendors, who move from place to place selling their food and stay at a particular place for some time for sale. The last ones are the stationary vendors who stay at a particular place for the entire time to carry out their sale. It has been observed that the food vendors are mostly poor, uneducated

and lack the food safety knowledge and these are the major risk to the public health. Food handlers play an important role in the food safety of the community by practicing hygiene, proper storage and certain preparation procedures which ensures the food safety. Hence ignoring these practices may cause various health related problems among the individuals of the society who consume the street food. In spite of various benefits offered by the street food industry, there are also various health risks associated with this industry. Various evidences reveal that these street vended foods are highly contaminated either due to unhygienic practices or invasion of microorganisms. Therefore this study was conducted to check the hygienic practices carried out by the most crowded street food vendors in Hyderabad i.e. the PaniPuri vendors.

AIMS AND OBJECTIVES

The aims and objectives of this survey was

The aims and objective of the present study was to

1. Know the level of awareness of the street food vendors regarding food sanitation and hygiene while handling food.

2. To observe and study the sanitation and hygiene practices followed by the food vendors.

METHODOLOGY

The study was a, cross sectional survey of 125 street food vendors carried out by conducting face to face interviews in the months of August-oct 2018.

The questionnaire was structured into three distinctive parts to collect information on (i) socio-economic data (ii) observer's questions and (iii) Food serving and hygiene practices followed by the street vendors.

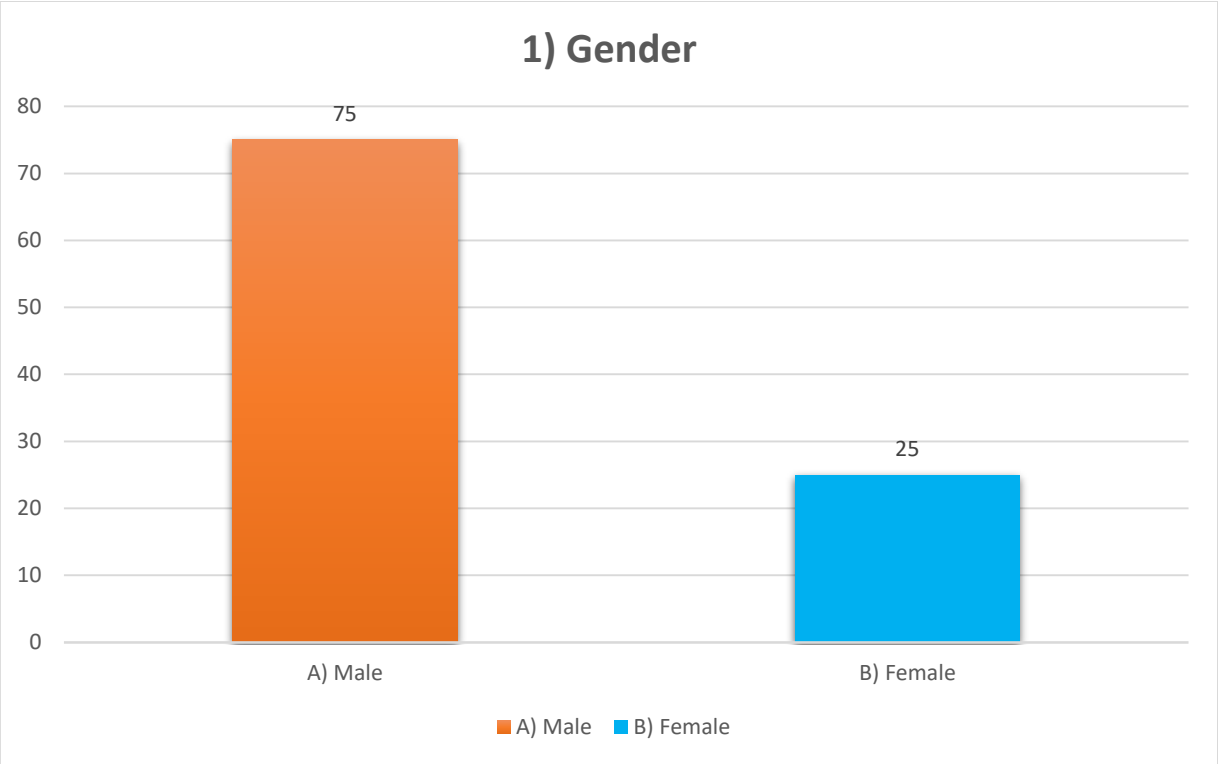
The survey was carried out by by 50 final year students of Bsc Applied Nutrition and Public Health at St. Ann's college, Mehdipatnam, Hyderabad,
The survey was carried via face to face interview method.
Each student was given 5 copies of the questionnaire to get the information from idli/dosa vendors and panipuri and chat vendors from different regions of the city

The section of questionnaire dealing with the food vendor's knowledge on food safety, personal hygiene comprised of 27 closed questions with two possible answers "yes" and "no". These questions specifically dealt with respondents' knowledge of personal hygiene, cross contamination, food-borne diseases, microorganisms, temperature control and hygienic practices.

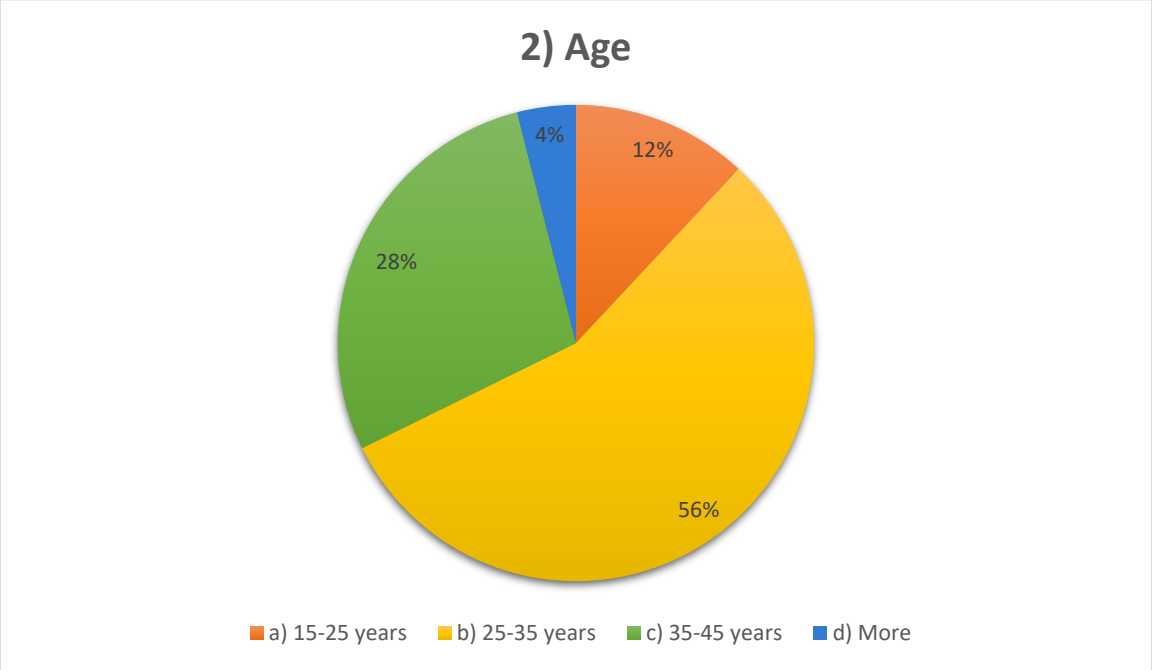
. The first section consisted of collecting information on respondents' demographic characteristics such as gender, age, level of education and years of work experience. The second section dealt with observing the environment of the stall, wearing if gloves and aprons by the vendors, proper serving of food item in cleaned utensils and usage and source of water supplied.
The last section comprised of food safety measures taken by the street vendors. It was concluded that majority of food-handlers in this study didn't know the importance of general sanitary practices such as regular hand washing before preparing food, wearing of gloves and proper cleaning of utensils.

RESULTS AND DISCUSSIOM

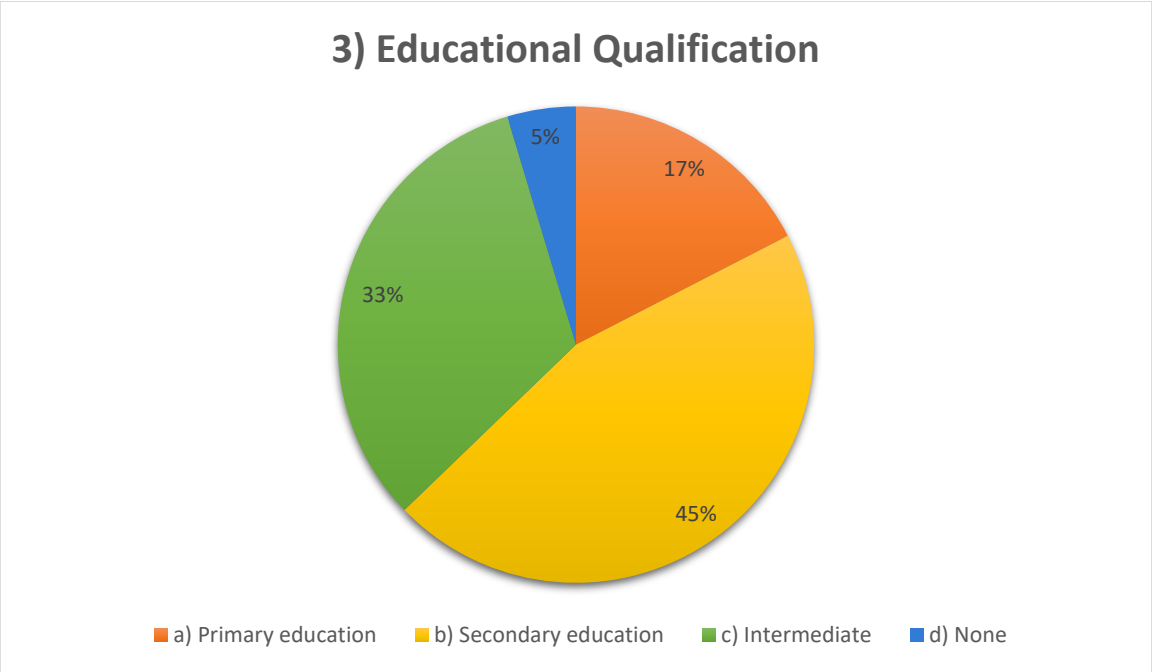
SOCIO ECONOMIC DATA



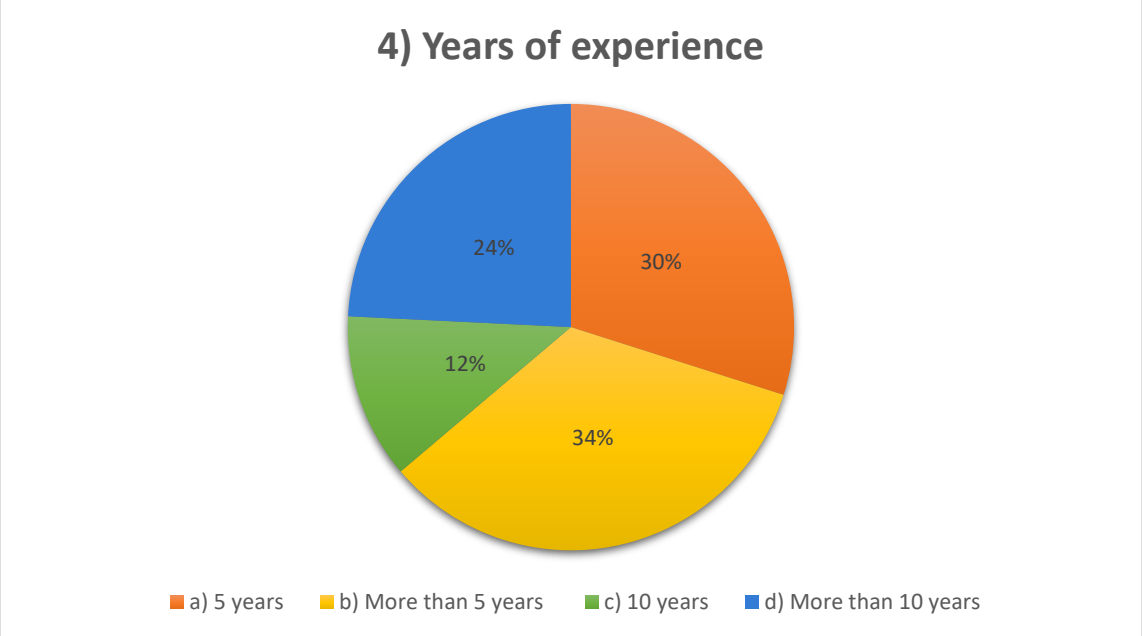
The following survey was conducted among 125 street vendors of which 75% were male and 25% were female.



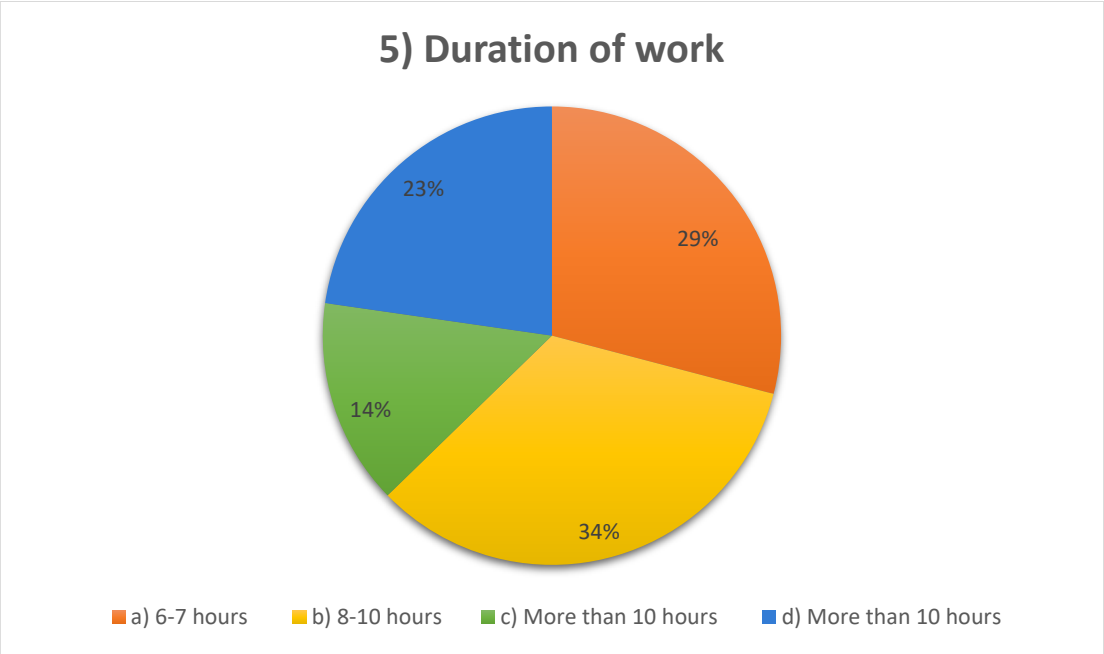
Majorly 25-35 years (about 56%) of street vendors were questioned. 28% of street vendors were of 35-45 years of age.



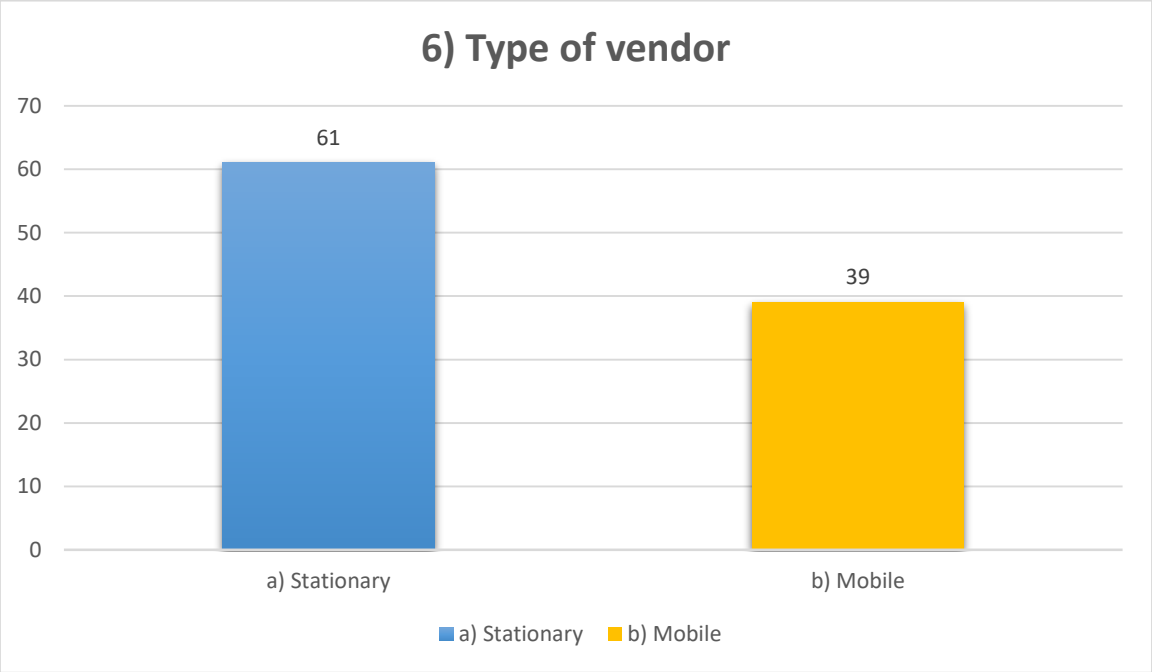
It was observed that 45% of the street vendors studied secondary education. 33% were found to be intermediate passed. 17% of them studied primary education and 5% were found to be uneducated.



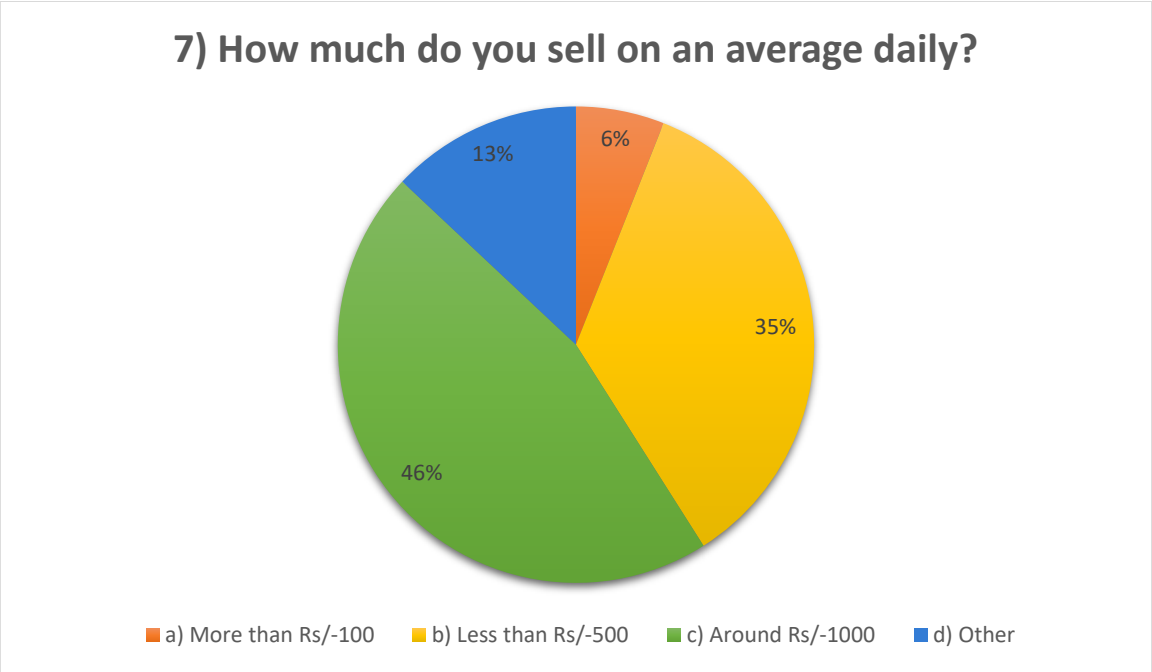
Years of work experience was asked and it was noted that majority of the workers had more than 5 years (34%) of experience. 30% had 5 years' experience followed by more than 10 years (24%) and 10 years of experience (12%).



34% of vendors worked for 8-10 hours and 29% of them worked for 6-7 hours and the remaining 23% and 14% worked for 10 hours and more than 10 hours respectively.

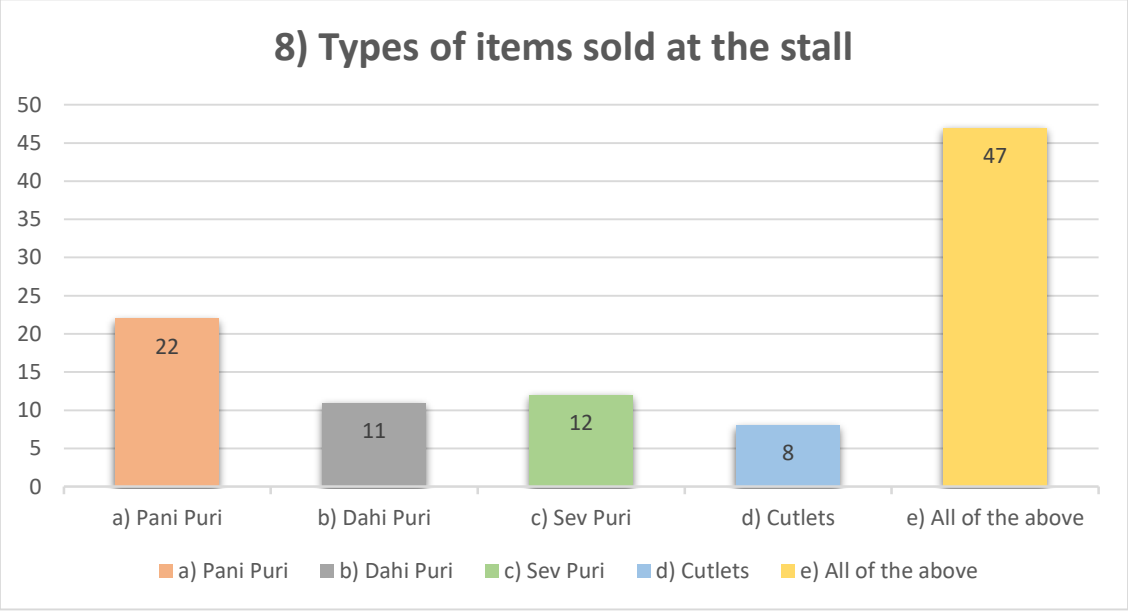


Two types of vendors were observed. Among which 61% were stationary and the remaining 39% were mobile.

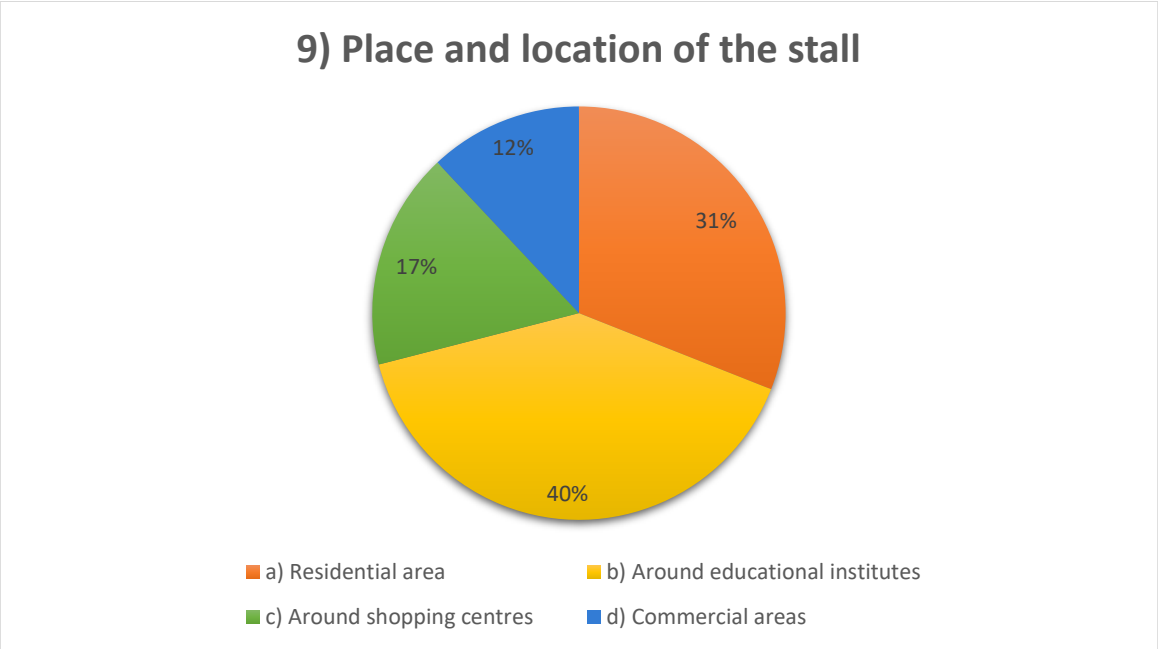


The vendors were asked about their daily income. 46% earned aroundRs/-1000 while 35% earned less than Rs/-500 and the remaining 13% and 6% earned more than Rs/-100 or below.

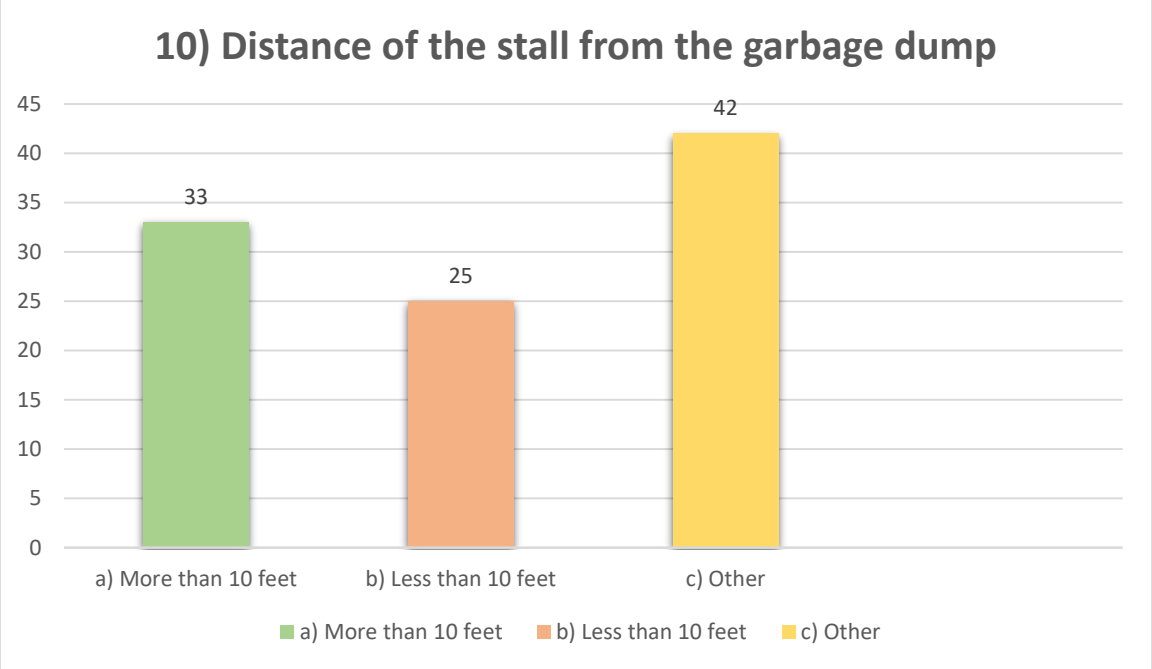
OBSERVER'S QUESTIONS



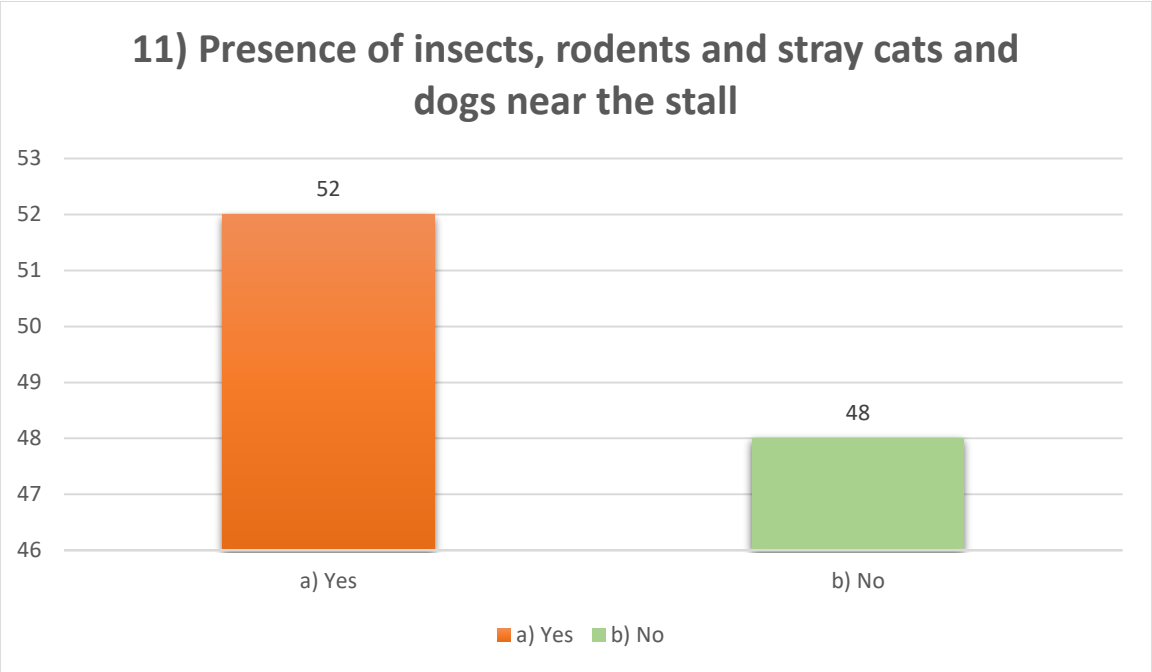
When observed the type of items sold at the stall, 47% had all of the above while 22% had panipuri and 12% had sevpuri followed by 8% cutlets.



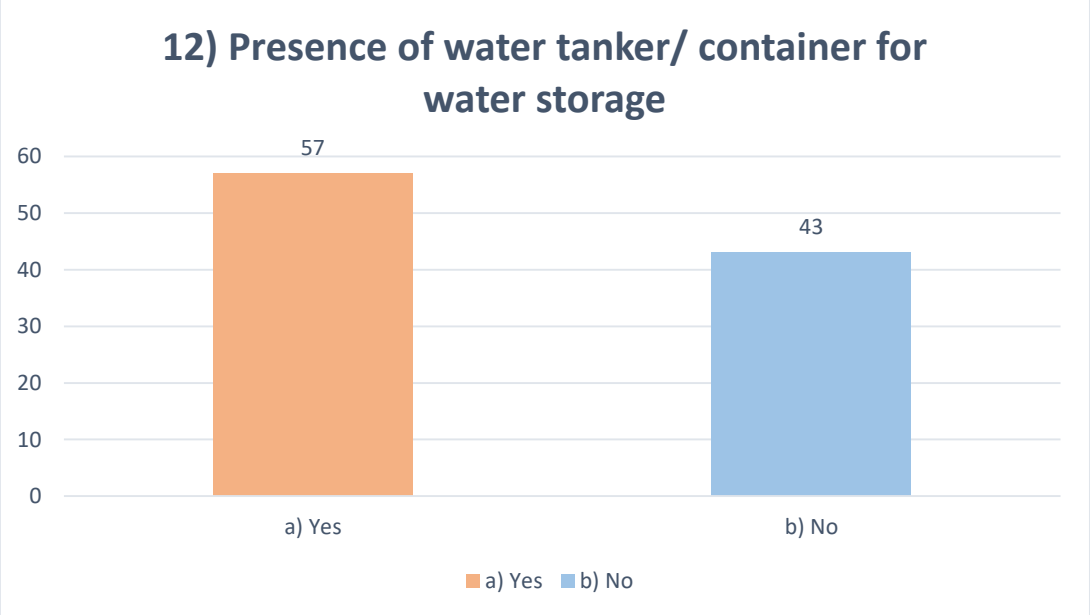
The above pie chart reveals the location of the stall. Most of the vendors were located near educational institutes (40%) and 51% werefound to be in residential areas. One fourth of them were near shopping centers (17%) and commercial areas (12%).



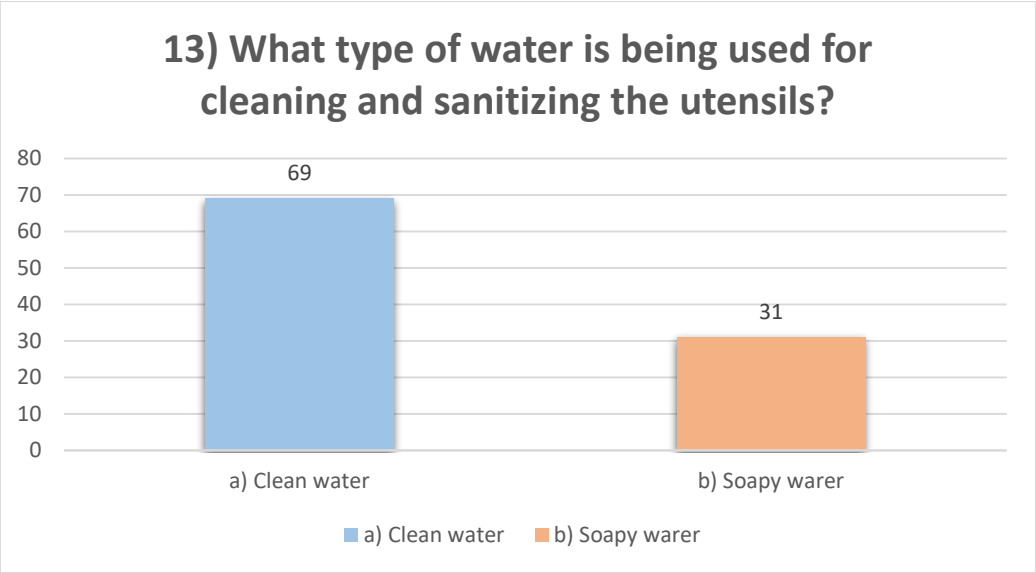
The distance of the stall from garbage dump was observed and majority of the stalls were found to be far off from the dump. One fourth (25%) of the stalls were very close to the garbage dump.



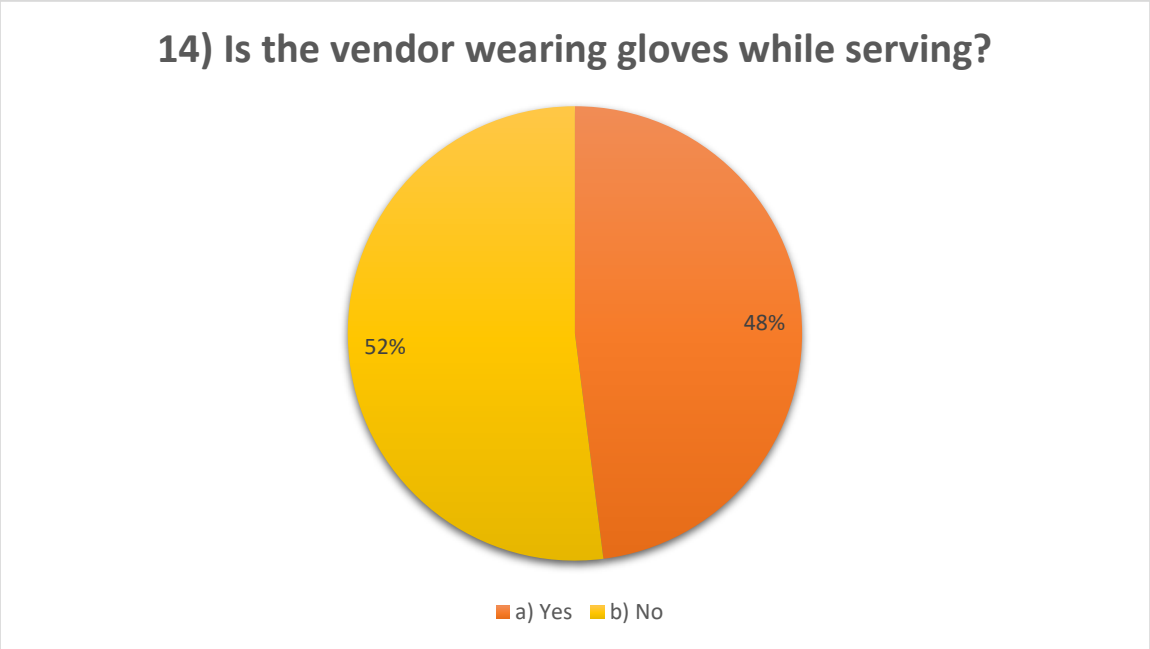
The above bar graph portrays the surrounding of the stall and 52% were observed to have insects, rodents and stray cats and dogs while the remaining 48% was excluded of them.



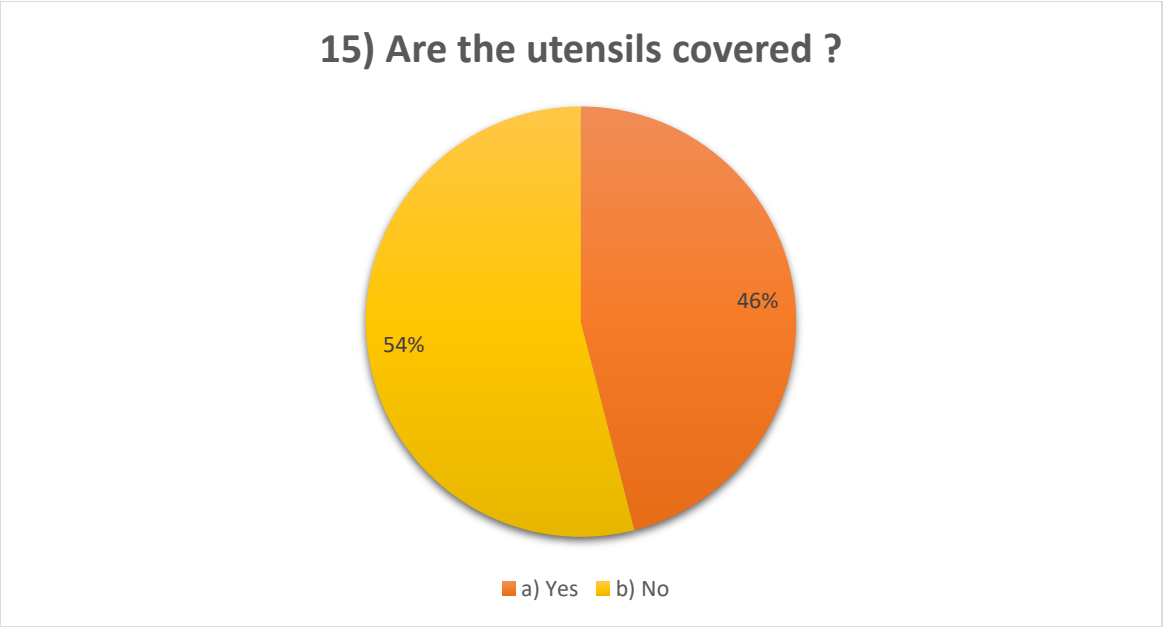
Presence of water tankers or containers for water storage was observed and 57% of the vendors were found to have it while the 43% didn't.



About 69% of the vendors used clean water for sanitizing the utensils and 31% used soapy water.

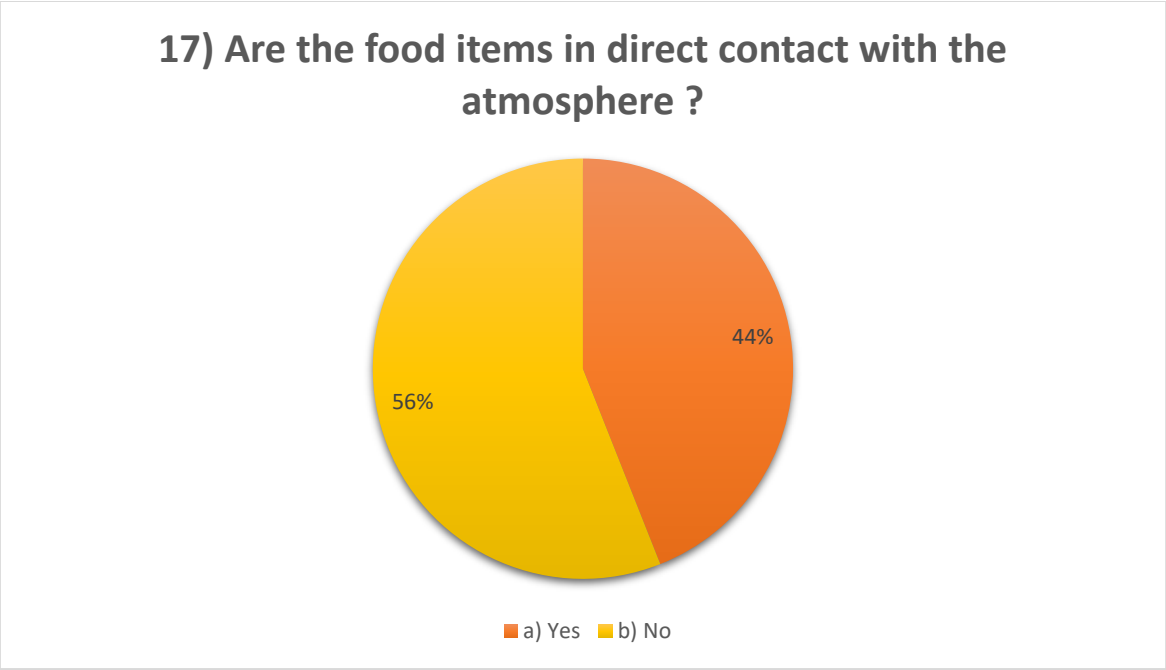


Majority of the vendors were observed not wearing gloves while the food items at the stall and 48% preferred using gloves.

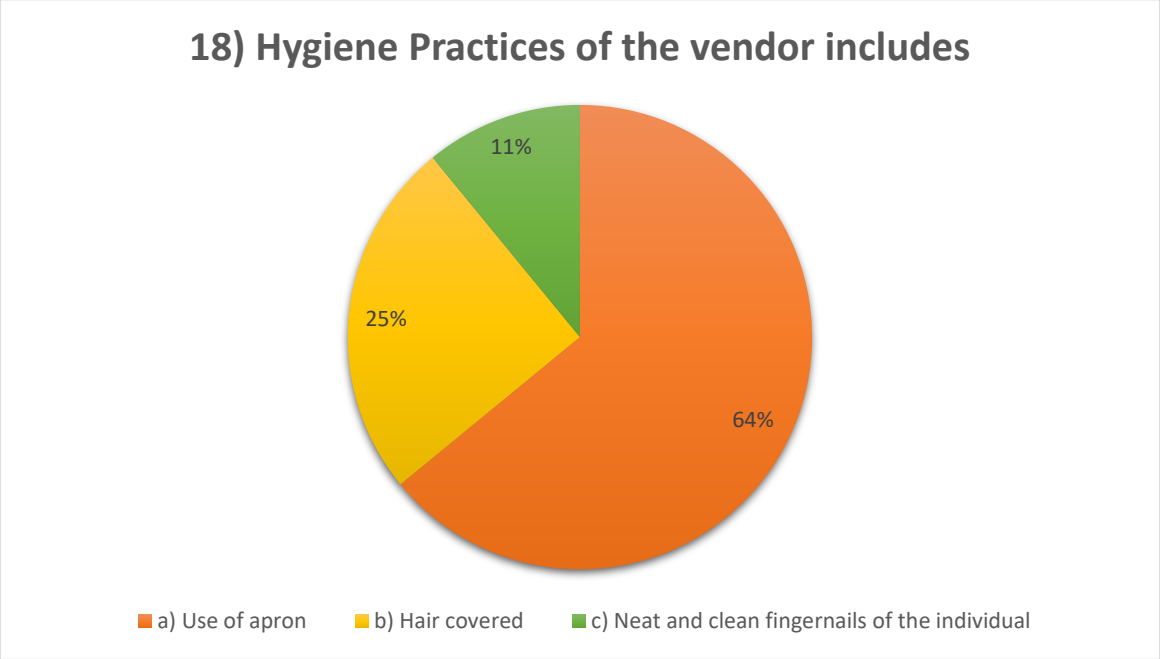


Some of the vendors (54%) considered to cover the utensils to avoid insects and some of them left the utensils uncovered (46%).

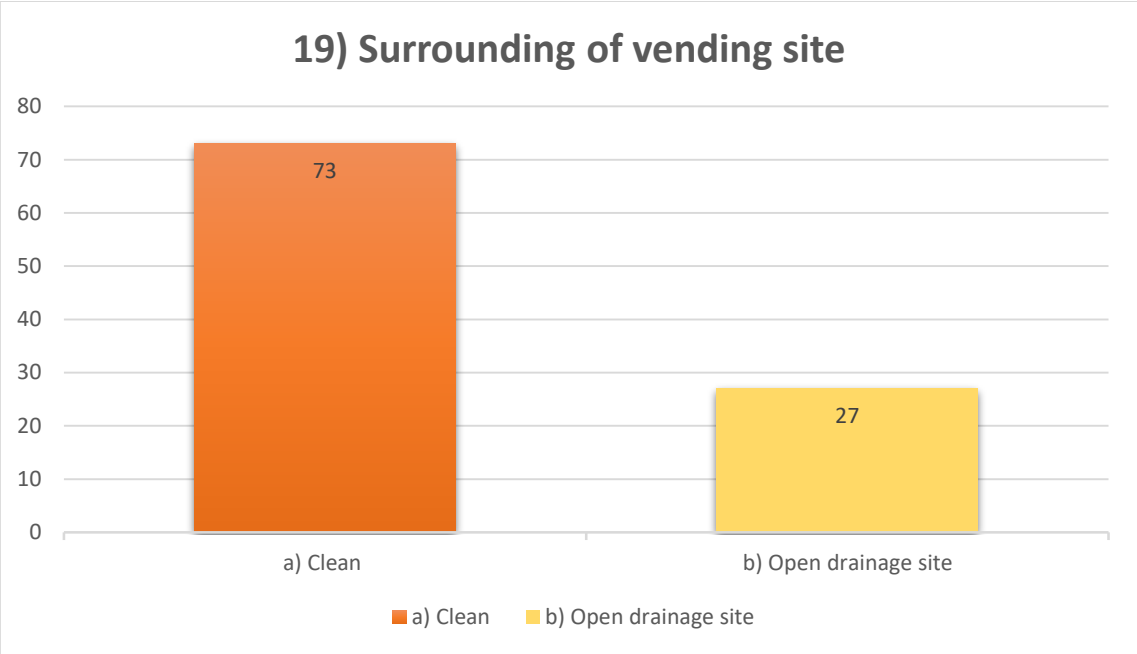
Majority (53%) of the vendors were found to be wearing clean clothes while the remaining 47% wore uncleaned clothes.



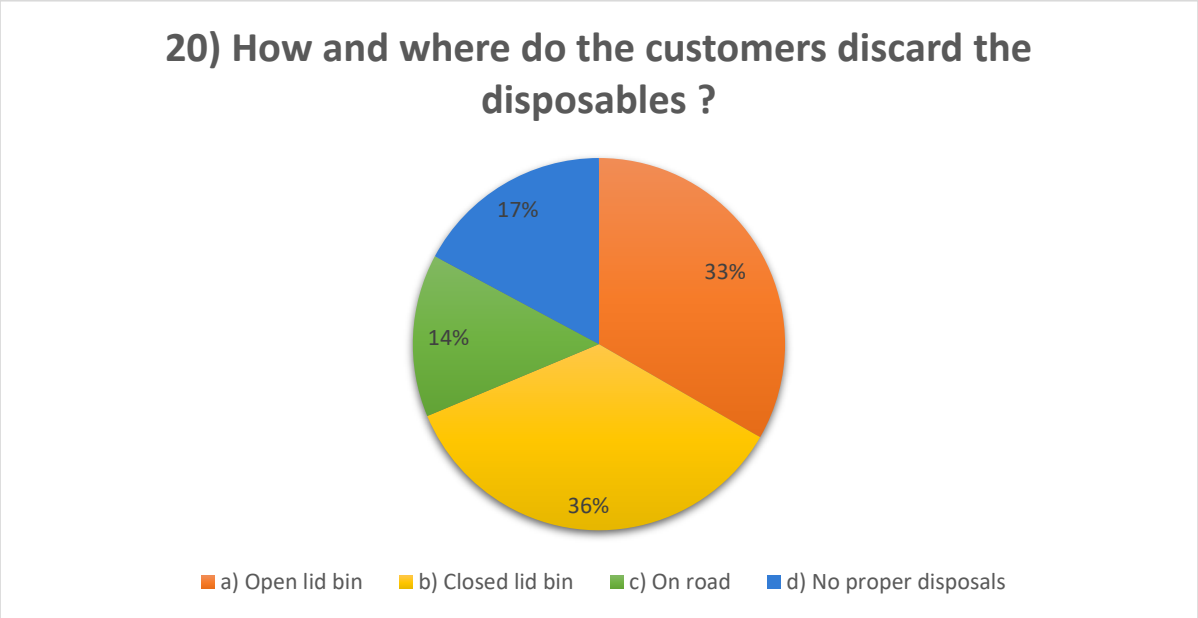
56% of food items were covered preventing the attack of insects on it while 44% were uncovered and much exposed to the atmosphere which could even lead to rancidity.



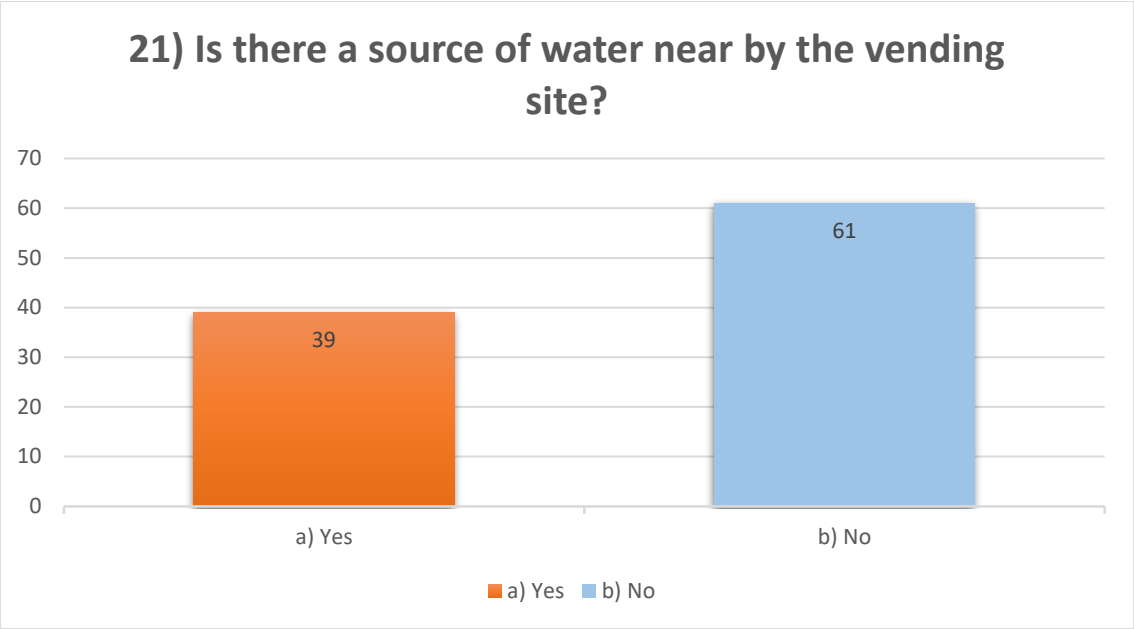
Hygiene practices of the vendors were observed and majority of them used aprons (64%) while the remaining 25% and 11% had their hair covered and clean finger nails respectively.



The above pie chart reveals the nature of the vending site and three fourth (73%) were found to be located in a clean surrounding while one fourth (27%) were found to be at an open drainage site.



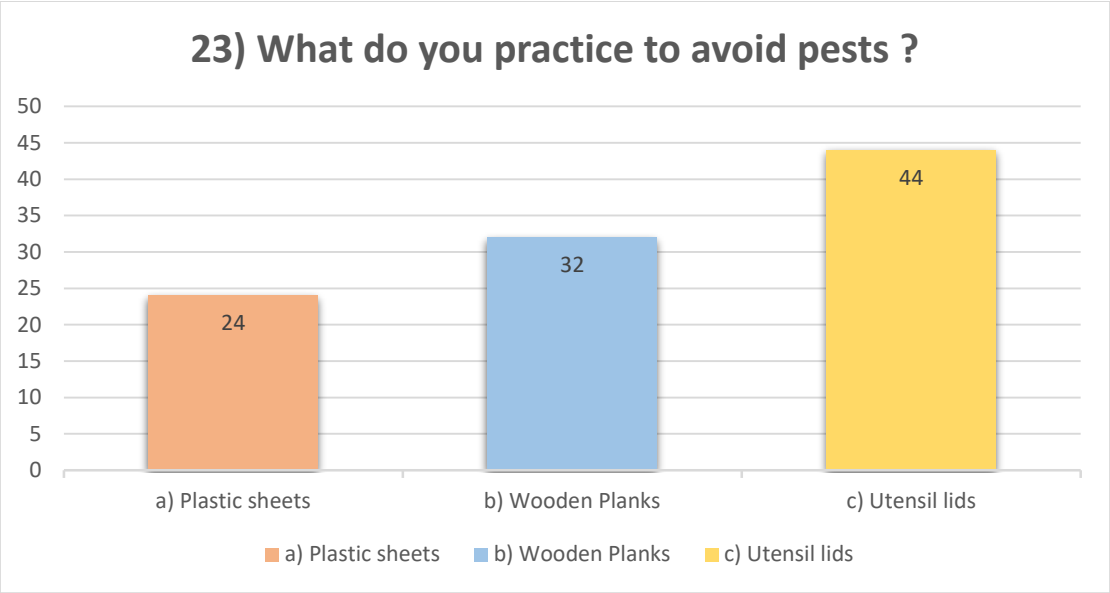
The above pie charts demonstrates the food vendors' customers' practices in discarding the disposals and 36% were found to discard the wastage in closed lid bins while 33% discarded in open lid bins and 17% didn't discard properly and 14% of them threw the disposals on the road carelessly.



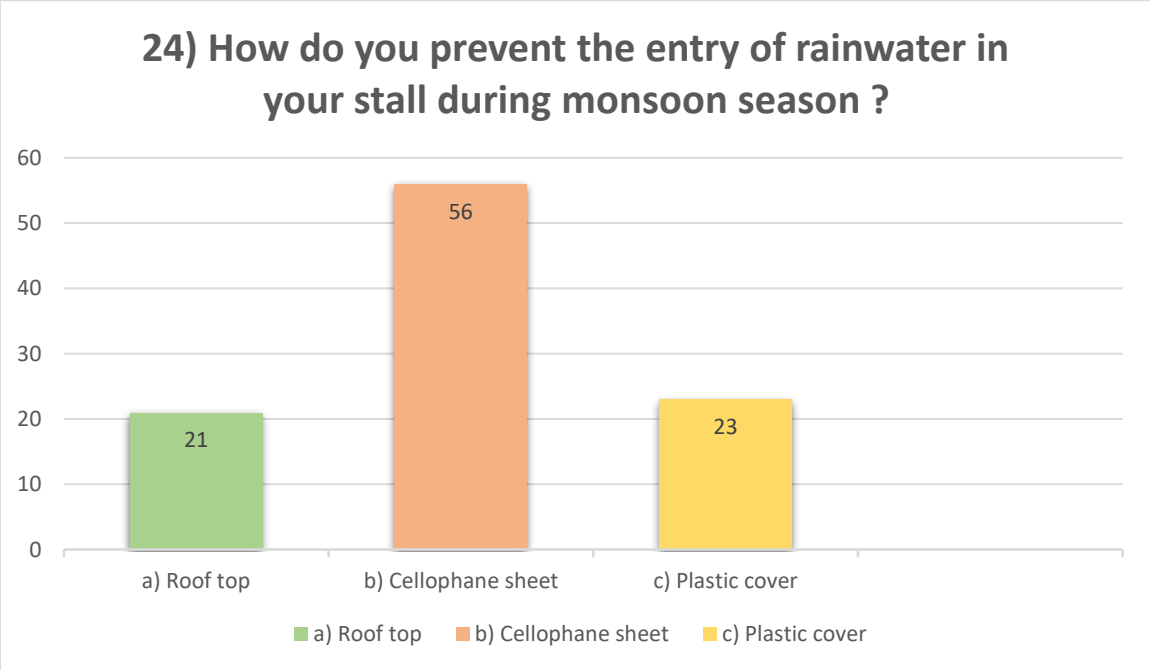
Two third (61%) of the stalls were found to have a source of water while remaining one third (39%) didn't.

FOOD SERVING/HYGIENE PRACTICES

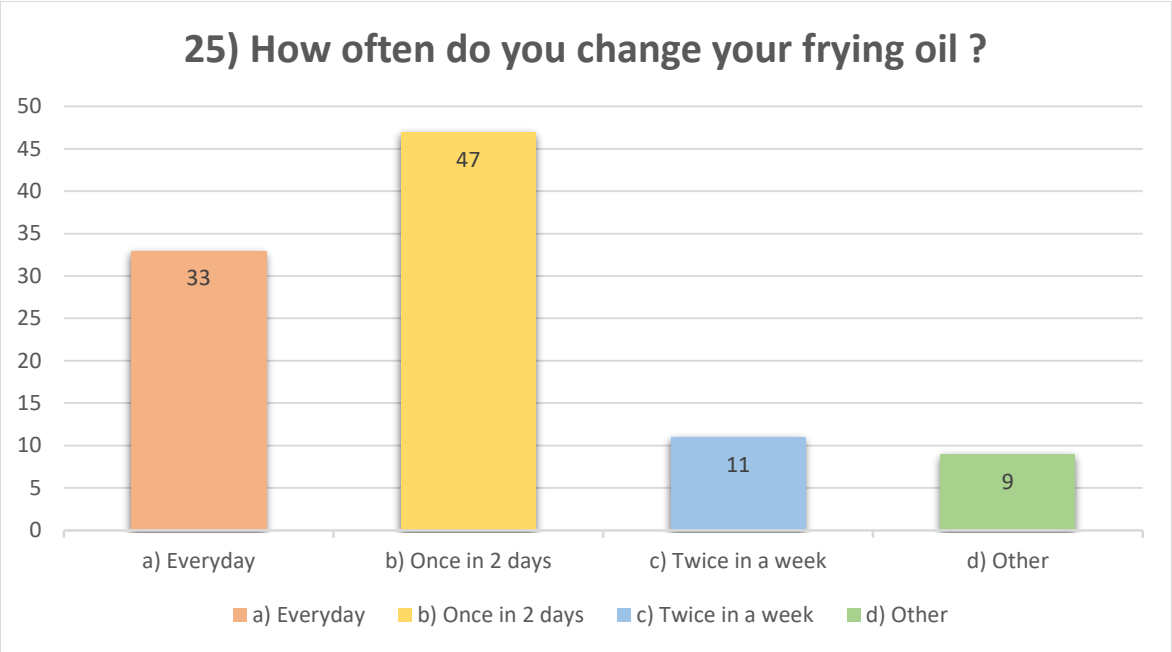
Half (40%) of the food vendors cleaned their stall and utensils once in a day followed by 23% to clean twice in a day and 21% cleaned once in two days while the remaining 16% were in the other category.



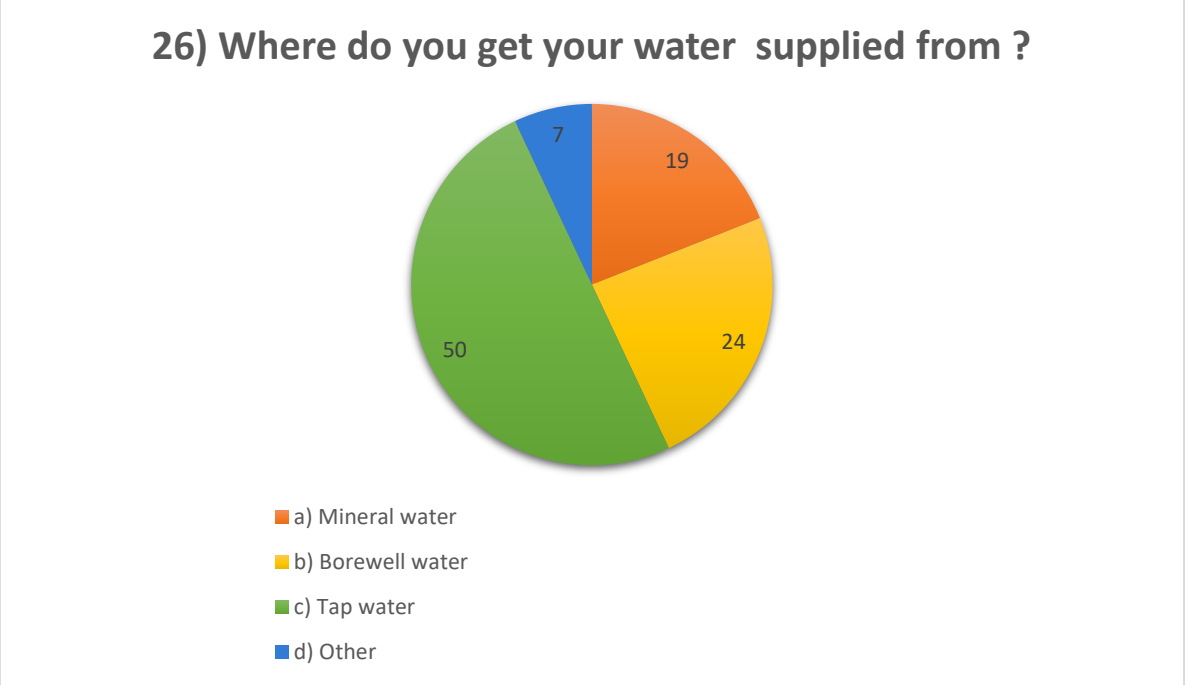
44% of the food vendors used utensils lids to avoid pests while 32% used wooden planks and 24% used plastic sheets.



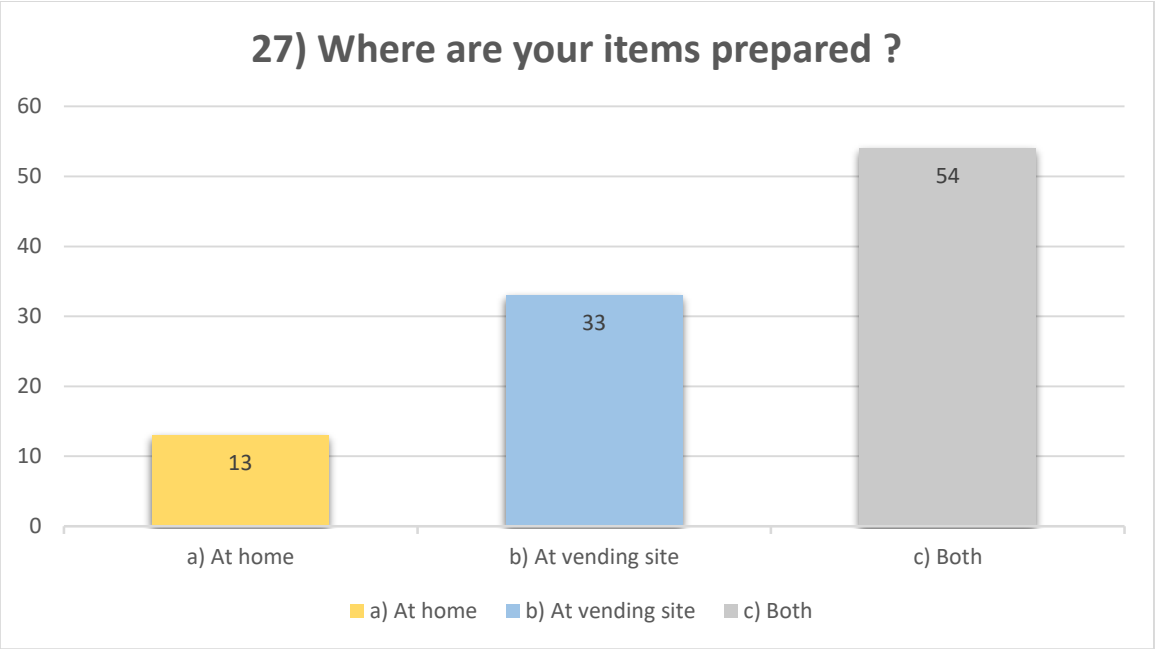
Half (56%) of the food vendors avoided the entry of rainwater in the stall by using cellophane sheets and one fourth (23%) of them used plastic covers and the remaining (21%) had a roof top on their stalls.



Majority (44%) of the food vendors were observed to use the same oil for two days straight while 33% changed the frying oil daily. Some (11%) even preferred to change it twice in a week remaining 9% were in the other category.



The above bar graph shows that half (50%) of the vendors used tap water and one fourth (24%) of them used borewell water while the remaining 19% and 7% used mineral water and other respectively.



(54%) of the vendors prepared their items at the vending site as well as home while (33%) preferred to do it at the vending site and (13%) prepared it at home.

RESULTS

The total number of street food vendors under study was 125 from different localities which included two kinds of vendors' i.e. stationary and mobile vendors. Data was collected based of a questionnaire which included both an interview and observational questions. The findings showed that majority of the street food vendors were males. Majority of them were in between the age of 25 to 35 years. Majority of them had just completed their secondary school. It was noted that majority of the vendors had a work experience of around 5 years. 34% of these vendors worked for around 8-10 hours a day. Majority of these vendors earned around Rs 1000 on daily basis. Certain observations were made and data was collected. Most of these stalls were located near the educational institutes. Majority of these stalls were far away from the municipal garbage bins. Around 52% of these stalls were surrounded by pests, rodents, stray dogs and cats. Most of the stalls had the water tankers at the site. Majority of the vendors used the clean water for washing their utensils while the others used soapy water. Most of the vendors considered to cover their utensils from the pests and rodents while the other did not care. Most of the vendors were neatly dressed and maintained personal hygiene, most of the stalls were located in the clean surroundings, they had proper disposal bins with lids, had a proper source of water, utensils were covered with lids and stalls were with proper shade to avoid the entry of rainwater. Majority of the vendors cleaned their utensils once in a day and used the same oil for cooking for two days.

Majority of the vendors maintained the hygienic conditions at the stall and their personal hygiene. The stalls were located in clean surroundings except for a few. Most of the vendors chose sites for their stalls away from the municipal garbage bins and maintained a proper disposal system at their stalls. They had a proper water supply at their stalls except for few.

DISCUSSION

Foods prepared at the food stalls at the corner of the street usually do not follow the **hygienic** conditions for their preparation and store the food for a very long period of time in unsuitable conditions before selling or serving them. **Mishandling of food** can lead to many food borne diseases and in severe cases it may even lead to death(.6) Food-borne related illnesses have increased over the years, and negatively affected the health and economic well-being of many developing nations.(1,2) Food poisoning occurs as a result of consuming food contaminated with microorganisms or their toxins, the contamination arising from inadequate preservation methods, unhygienic handling practices, cross-contamination from food contact surfaces, or from persons harboring the microorganisms in their nails and on the skin.(2,3) The above findings highlight the importance of Food-hygiene Practices in foodservice establishments among panipuri vendors. The government's involvement should be a part of the general food inspection. Street vendors should be authorized and hold a license for selling their items on the street. They should be recommended to wear aprons and head gears while cooking the food to avoid contamination of hair. Gloves should be worn to prevent food borne illness. The survey results show that food handlers have a poor perception of their leaders'management of food-hygiene practices and even suggested that factors such as the environment, education, role modeling, and knowledge may be more important determinants.

CONCLUSION

Based on the current report, it can be concluded that most of the street food vendors had the basic availability of infrastructure at their working site. While they still did not have the basic knowledge of carrying out a healthy preparation of food. This is because majority of the vendors used the same oil for around two days for the preparation of food articles. As regards to their qualification most of the vendors completed only their secondary education. As for their hygienic practices, most of the vendors wore neat and clean clothes and few of them maintained their apron code while serving and preparing the food, handled food wearing gloves and minority were not maintaining nails and their dress. Moreover, personal hygienic practices of street food vendors including hair covering and wearing an apron were significantly influenced by their knowledge.

RECOMMENDATIONS

The following recommendations are derived from the current study results.

- It has become necessary that the systems should be enforced to ensure that food handlers remain aware of all procedures necessary to maintain the safety and suitability of food.
- Food vendors' education is important issue as the vendors should be adequately educated about the relation between the food and disease transmission as well as on principles of personnel hygiene.
- The major authorities may issue the licenses to the street food vendors only once they fulfil the basic and essential food safety and hygiene principles.
- A routine health examination of the food handlers at these street food stalls must be carried out by the health officers to keep a check and maintain the hygienic conditions at the food stalls.
- Periodic training of these vendors can help improve and maintain the conditions.

REFERENCES

The survey was done implicating the results and methodology of reference published reports. The referred links are hereby attached.

1. Assessment of food safety knowledge and hygienic practices among street food vendors in Alexandria. http://www.damanhour.edu.eg/pdf/207/6-food%20vendors(1).pdf
2. A brief study of Street Vendors in the city of Bengaluru http://static.esgindia.org/campaigns/commons/reports/StreetVendors.Report.Oct2010.pdf
3. Food safety and hygiene practices among street food vendors in Delhi https://www.researchgate.net/publication/260230444_Food_safety_and_hygiene_practices_among_street_food_vendors_in_Delhi_India
4. Food safety and hygiene practices among street food vendors in India https://www.journalcra.com/article/food-safety-and-hygiene-practices-among-street-food-vendors-delhi-india
5. Hygienic Practices among Food Vendors in Educational Institutions in Ghana: The Case of Konongo https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5302301/
6. Hygiene practices among street food vendors in Tamale Metropolis https://www.ajol.info/index.php/jmbs/article/view/136001
7. Personal and food hygiene practices among street-food vendors in Sabon-Gari local government area of Kaduna State, Nigeria http://www.archms.org/article.asp?issn=2543-1951;year=2018;volume=3;issue=2;spage=77;epage=83;aulast=Umar

To Conduct the Nutrient and Objective Analysis of Burfi Enriched with Oats.

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AUTHOR 2: Mrs Shruti Kabra, Faculty Department of Nutrition, OUCW, Kothi
AUTHOR 2: Mrs Meena Kumari, Dean.Admin& Head of the Department,

ABSTRACT

Indian sweets are locally called as Mithai. Sweets are indespensable part of Indian culture for festive seasons. In the present study milk based sweet i.e burfi was prepared, with one basic and two variations. Same method of preparation and temperature was followed for preparing both basic and the variations. All the variations were formulated. To develop a value added burfi, oats flour was incorporated, whereas the commonly consumed maida burfi was prepared as a basic. (3)By adding known quantities of oats flour in place of maida, two variations were prepared. Enriched Burfi was subjected to nutrient analysis where the protein, fat, fibre, moisture and ash content was analysed in the laboratory using standard methods.(1) It was also subjected to texture analysis by using a texturometer. The variations enriched burfi was found to be superior to the basic products in terms of nutrient analysis and texture analysis

INTRODUCTION

Indian sweets are locally called as Mithai.They diverge in Taste, aroma ,shapes and colours. Sweets are indespensable part of Indian culture for festive seasons.

BURFI:

Burfi, is a sweet confectionary from the Indian subcontinent. Plain barfi is made from condensed milk or khoa cooked with sugar until it solidifies. (1)The many varieties of barfi include besan barfi (made with gram flour), kaaju barfi (made with cashews), and pista barfi (made with ground pistachios). The name is derived from the Persian word barf which means "snow", since barfi is similar to ice/snow in appearance, this is why it is served cold. Barfi is often flavored with fruit (such as mango or coconut) or nuts (such as cashew and pistachio) and spices such as cardamom or rose water.Burfi contains high amounts of fat (19.52%) and sugar (29.4%)(4)

Burfi has been flavoured as one of the most popular khoa based sweet all over India. The adaptability of khoa in terms of its flavour, body texture to blend with a wide range of food adjust had permitted development of an impressive array of Burfi varities. (3)

KHOA:

Khoa is a milk food widely used in Indian and Pakistani cuisine, made of either dried whole milk or milk thickened by heating in an open iron pan. It is similar to ricotta cheese, but lower in moisture and made from whole milk instead of whey. Khoa is normally white or pale yellow. Khoa is made by simmering full-fat milk in an iron karahi for several hours, over a medium fire. The gradual vaporization of its water content leaves coagulated solids in milk, which is khoa.(2)

OATS:

The common oat (Avena sativa) is a species of cereal grain grown for its seed, which is known by the same name (usually in the plural, unlike other grains).Oats have numerous uses in food; most commonly, they are rolled or crushed into oatmeal, or ground into fine oat flour. Its consumption is believed to lower LDL ("bad") cholesterol, and possibly to reduce the risk of heart disease.Oats contain more soluble fibre than any other grain, resulting in slower digestion and an extended sensation of fullness.One type of soluble fibre, beta-glucans, has proven to help lower cholesterol. (8)Oats with elevated β-glucan concentrations can be successfully incorporated into extruded breakfast cereal with minimal processing alterations.

AIMS AND OBJECTIVES

AIM:

To conduct the nutrient and objective analysis of the developed product

OBJECTIVES:

The objectives of the study were as follows:

1. To calculatethe nutritive value of Burfi and compare with the chemically analysed values.

2.To analyze the protein, fat, fibre, moisture and ash content of the Burfi.

3. To analyze the texture of the developed product.

METHODOLOGY

PRODUCT DEVELOPMENT:

Product development in nutritional context means, the act of developing a basic product into a new or value added product, which is high in terms of nutrients and other health benefits. Because of the quality and sometimes almost mystical reputation and characteristics of most primary products, their addition to other products usually enhances the nutritive value or quality of these secondary products. For this reason, the secondary products, which partially,or wholly can be made up of primary products, are reffered to here as "Value added" products or developed product.

The product has been developed as a value added sweet item which can be given to normal population of all the age groups except geriatrics. The main ingredients of the basic is khoa, which is the rich source of calcium and proteins. The limitations and household environment was taken into considerations in the preparation method.

PROCUREMENT OF SAMPLE:

All the ingredients used for the prepration of basic and variations were procured from the local shop at Langar house, Hyderabad.

FORMULATION:

The method of preparation of basic and variations is same for making burfi. In the variations different quantities of oats flour was substituted with maida and sugar quantity is kept constant for all the products.

LIST OF INGREDIENTS FOR BASIC AND VARIATIONS:

INGREDIENTS	BASIC	VARIATION I	VARIATION II
Khoa(g)	60	60	60
Powdered sugar(g)	30	30	30
Maida(g)	10	5	2.5
Oats flour(g)	_	5	7.5

METHOD OF PREPARATION:

STEP 1: Khoa was heated with stirring in karahi till pasty consistency was obtained.
STEP 2: Maida was added to heated khoa and mixed well
STEP 3:To the above mixture powered sugar was added and was heated till it begins to leave the sides of karahi.
STEP 4:The above mixture was spread on the greased plate and was allowed to cool.
STEP 5:After the mixture was set it was cut into the desired shapes.

NOTE: The method of preparation of variations is same except in the step 2 where maida and oats flour in proportions 10:0, 5:5 and 2.5:7.5 are taken in basic and variations 2 & 3 respectively was added to the heated khoa.

NUTRIENT ANALYSIS:

PROTEIN CONTENT ESTIMATION:
The protein content of the sample was estimated using Dumas Method, Where the known amount of sample is combusted to know the nitrogen content present in it.

FAT CONTENT ESTIMATION: By using the Soxtherm Method the sample is immersed in hot solvent the free fat is removed more quickly than the traditional method. It can also evaporate and recover the solvent.

FIBRE ESTIMATION: For crude fibre the samples are digested in acid, rinsed, and boiled in caustic rinsed again and then taken out and dried by using **Fibretherm - Analysis**.After the boiling, rinsing and filtration phases, the residueof chemicals is sucked off automatically.

MOISTURE ESTIMATION:

Moisture was determined according to the procedure given by AOAC (1975) by drying the sample (2g) at 105^0C in moisture oven in pre dried and weighed aluminum dishes until constant weight was obtained.

TOTAL ASH ESTIMATION:

Total ash in the sample was determined according to the method of AOAC (1975). Two-gram sample was charred in predried and weighed porcelain crucible. Charred sample was incinerated in muffle furnace at 500-570^0C for 8 hours or till the ash becomes white or grayish white in colour. After ashing porcelain crucibles were removed, allowed to cool in desiccators and weighed.

OBJECTIVE ANALYSIS:
TEXTURE ANALYSIS: The principle of texturometer is to deform the sample in a controlled manner and measure its response. Imagine turning a lab balance upside down and pressing the balance pan down into the sample.
The force response of the sample would be shown on the digital display moving up or down depend on how you pushed the balance into the sample.

METHOD:
The texture of the Burfi is evaluated using a TMS Lab pro Texture analyser equipped with a load cell and a fixture table and T-slot mounting base.The force data is recorded with the texture expert software (stable Microsystems) and the texture of each sample is expressed as the max compression force(Newton) when applying a vertical downward movement at the middle of the burfi, reffered to as bending force.

RESULTS AND DISCUSSION:

NUTRIENT ANALYSIS:

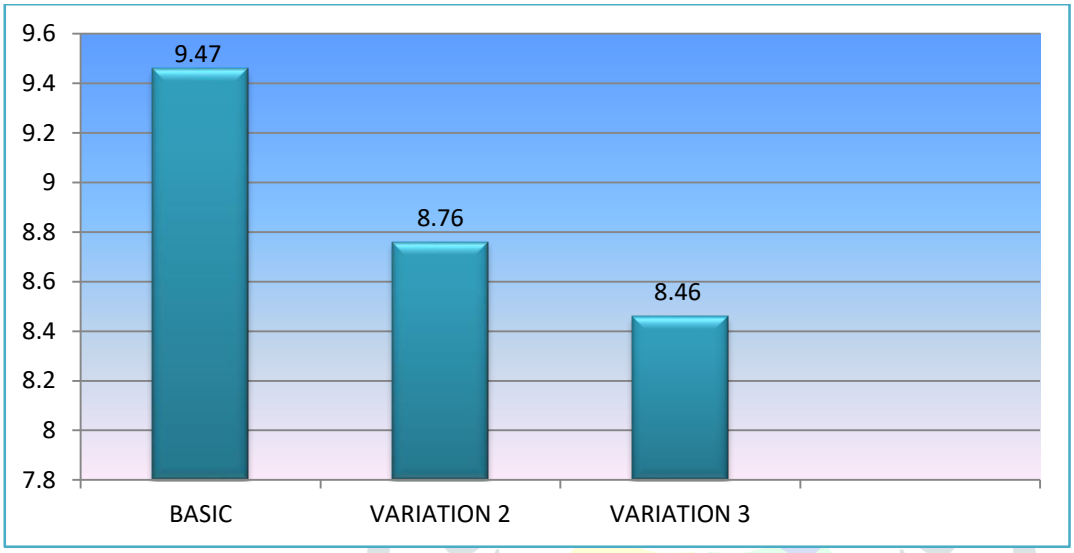
COMPARISON OF THE CALCUALTED VALUE AND ANALYSED VALUES OF PROTEIN, FAT AND FIBRE CONTENT OF BASIC AND VARIATIONS OF BURFI:

SAMPLE :	PROTEIN CONTENT (g):	CALCULATED PROTEIN VALUE(g):	FAT CONTENT (g):	CALCULATED FAT VALUE (g):	FIBRE CONTENT (g):	CALCULATED FIBRE VALUE(g):
BASIC	9.47	9.93	14.46	18.8	0.06	0.03
VARIATION 2	8.76	9.98	10.65	19.2	0.74	0.51

VARIATION 3	8.46	10.03	9.89	19.4	0.78	0.75

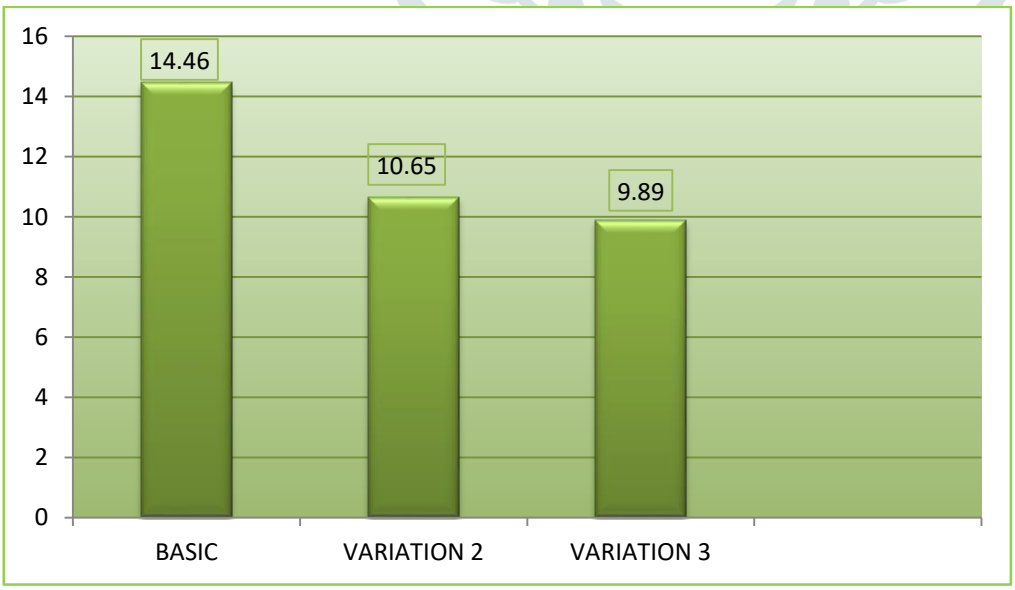
From the above table it is clear that the calculated nutritive value and the analysed nutrient values are almost the same with very little fluctuation.

Nutrient analysis of burfi was done using standard methods to find the protein ,fat and fibre values of the Basic, Variation 2, Variation 3. This Table shows the result of the nutrient analysis, representing the protein, fat and fibre values of the basic and the variations.



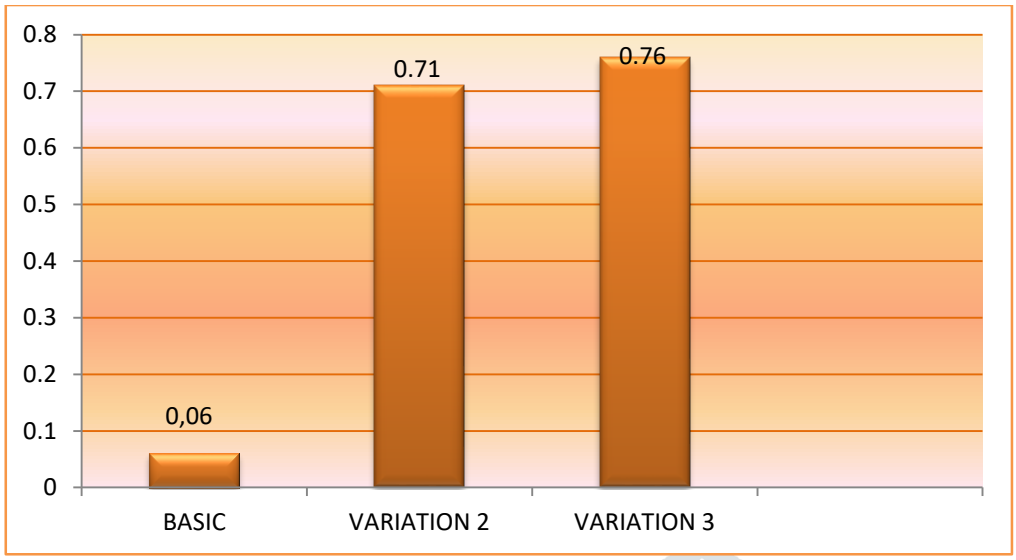
Comparison of Protein content in Basic and the Variations of Burfi.

Figure shows the comparison of the protein value of the basic and variations. The protein value of basic, variation 2 and variation 3 was found to be 9.47 g, 8.76g and 8.46 g respectively. Basic was found to have high protein content.



Comparison of Fat content in Basic and the Variations of Burfi.

. Figure shows the comparison of the fat value of basic and variations. The fat value of basic, variation 2 and variation 3 was found to be 14.46, 10.56g and 9.89g respectively. Basic was found to have high fat content.



Comparison of Fibre content in Basic and the Variations of Burfi.

. Figure shows the comparison of the fibre value of basic and variations. The fat value of basic, variation 2 and variation 3 was found to be 0.06g , 0.71g and 0.71g respectively. was found to have high fibre content.

MOISTURE ANALYSIS:

Moisture was determined according to the procedure given by AOAC (1975) by drying the sample (2g) at 105^0C in moisture oven in pre dried and weighed aluminum dishes until constant weight was obtained. The loss in weight of the sample was used to calculate percent moisture.

SAMPLES:	**MOISTURE CONTENT:**
Basic	25%
Variation 2	14.5%
Variation 3	18%

Illustrates the Percent moisture content (g/100g) of the basic and variations of burfi.It was found to be highest in Basic i.e 25%, followed by 18% in Variation III and least in Variation II i.e 14.5%.

ASH ANALYSIS:

Total ash in the sample was determined according to the method of AOAC (1975). Two-gram sample was charred in predried and weighed porcelain crucible. Charred sample was incinerated in muffle furnace at 500-570^0C for 8 hours or till the ash becomes white or grayish white in colour. After ashing porcelain crucibles were removed, allowed to cool in desiccators and weighed. Porcelain crucibles were kept in air oven at 100^0C for one hour, cooled and weighed to a constant weight, percent ash was calculated.

SAMPLES:	**ASH CONTENT:**
Basic	1.6%
Variation I	2%

Variation II	2%

Illustrates the percent ash content in basic and variations of burfi. The Percent ash(g/100g) was found to be least 1.6% in Basic and highest i.e 2% in both Variation II and III.

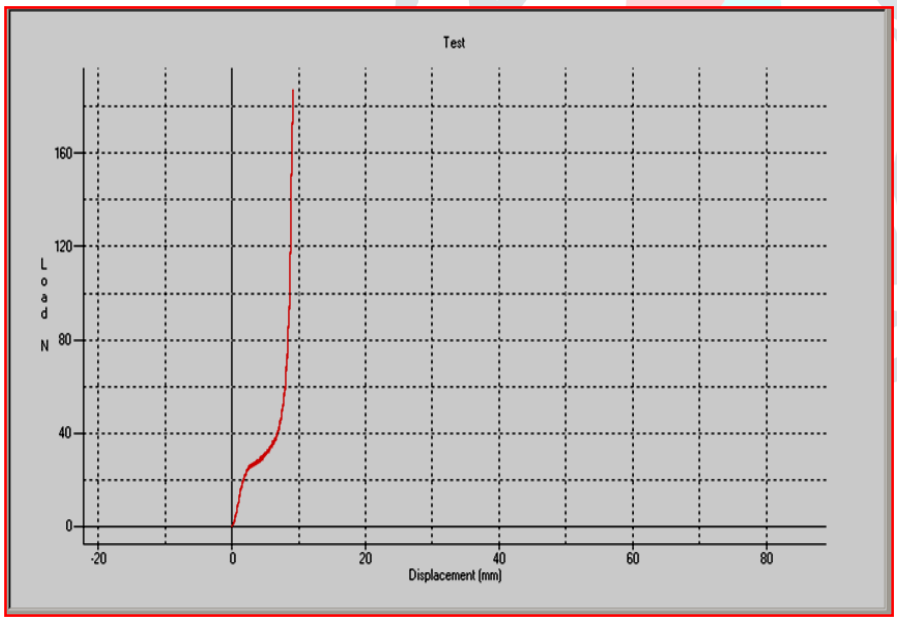
OBJECTIVE ANALYSIS:

COMPARISON OF TEXTURE DIFFERENCE BETWEEN BASIC AND VARIATIONS:

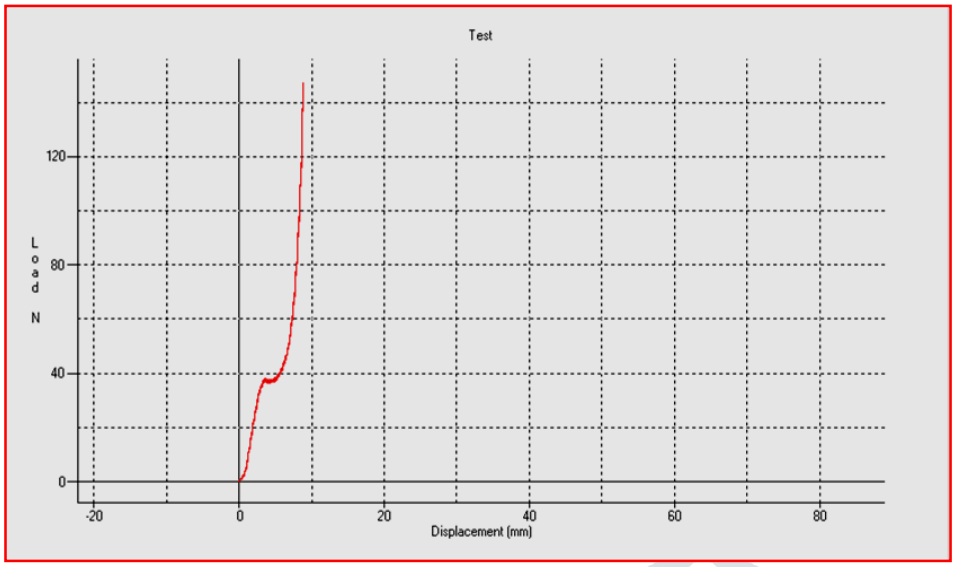
BURFI SAMPLES:	LOAD (N):	DISPLACEMENT(mm):
Basic	40 N	5 mm
Variation II	40 N	5.5mm
Variation III	40N	6mm

Table shows the result of texture analysis of the basic and the variations.It is indicated from the table that, when same force of 40 N is applied to all the three samples, the displacement is 6mm in variation 3 as its texture is firm when compared to other samples. Whereas variation 2 showed less displacement of 5.5 mm and basic showed the least displacement of 5mm because of soft texture.

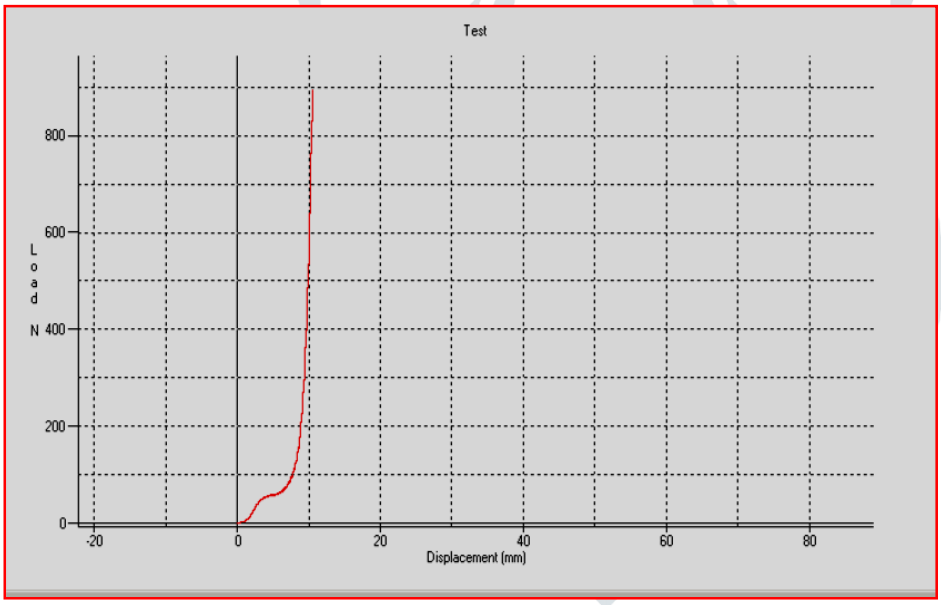
The texture of Burfi was analysed using a Texturometer and the results were obtained in the form of graphs. The graph is plotted by taking Displacement (mm) on x- axis and Load(N) on y- axis.



Illustrates the texture analysis of Basic sample of Burfi, showed displacement at 5mm when 40N force was applied to it.



Illustrates the texture difference in Variation 2 sample of burfi. It showed a displacement of 5.5mm when a force of 40 N is applied to it.



Illustrates the texture difference in Variation 3 sample of burfi. It showed a displacement of 6mm when a force of 40 N is applied to it.

RESULTS AND DISUSSION

In the present study milk based sweet i.e burfi was prepared, with one basic and four variations. Same method of preparation and temperature was followed for preparing both basic and the variations. All the variations were formulated.

To develop a value added burfi, oats flour was incorporated, whereas the commonly consumed maida burfi was prepared as a basic. By adding known quantities of oats flour in maida, two variations were prepared as the nutrient quality of oats products were higher than others.

Burfi was subjected to nutrient analysis. Protein, fat, fibre, moisture and ash were analysed in the laboratory using standard methods. Protein was estimated using Enhanced Dumas method, fibre was estimated using Fibretherm Gerhardt method and fat was estimated using Soxtherm method. Moisture was analysed using standard AOAC method of oven drying and ash was also

analysed using the standard AOAC method. The estimated values of the basic recipe were 9.47g of protein, 14.46g of fat, 0.74g of fibre, 25% moisture and 1.6% of ash. The estimated values for variation 1 were 8.76g of protein, 10.65g of fat, 0.71g of fibre,14.5% of moisture and 10% of ash. The estimated values for variation 2 were 8.46g of protein, 9.89g of fat, 0.71g of fibre, 18% of moisture and 10% of ash.

Among the basic and variations, variation II had the highest protein value, variation II had the highest fat value and variation II had highest fibre value.

Burfi was also subjected to texture analysis. Texture analysis was done using a texturometer. The texture meter is available with several interchangeable measurement heads (10 N, 50 N and 100 N), and it can be connected to a computer to plot the graph curves and record the calculated values. A very wide range of penetrators and sensors (cylinders, cones, plates, spheres, needles) are available to deal with the different types of foodstuffs, gels, or paste products to be tested. The speed and displacement values are shown continuously on the console display. The result for the texture analysis of the basic burfi was 40N force at 5mm displacement. For variation2 the result was 40N force at 5.5mm displacement and for variation 3 the result was 40N force at 6mm displacement. Among all the Basic and Variation samples of burfi, the texture of basic was found to be soft as the breaking strength of basic is less compare to variation 2, and variation 3 required greater breaking strength as its texture was found to be hard.

From the findings of the present investigation it is concluded that the variations enriched burfi was found to be superior to the basic products in terms of nutrient analysis and texture analysis. Therefore the burfi are rich in protein, fat and fiber.

SUGGESTIONS: The present study can be further followed to analyze the micro nutrients of the products which could not be done. It can also be further carried out by clinical assessment, bio-availability and storage studies.

CONCLUSION

From the findings of the present investigation it is concluded that the variations enriched burfi was found to be superior to the basic products in terms of nutrient analysis and texture analysis. Therefore the burfi are rich in protein, fat and fiber.When the samples was subjected to texture analysis, the texture of basic was found to be soft as the breaking strength of basic is less compare to variation 2, and variation 3 required greater breaking strength as its texture was found to be hard

RECOMMENDATIONS

The following recommendations are derived from the current study results.

- The enriched sweets products can be prepared at the household levels as they are cheaper than the market products and are also rich in nutrients.
- They can replace the traditional burfi, as the nutritive quality of the enriched burfi is greater than the traditional burfi.
- These can also be given to underweight people as they contain good amounts of calories as well as protein.
- They can be prepared as a sweet snack item for

- School going children
- Adolescents
- Pregnant women
- Lactating women

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The survey was done implicating the results and methodology of reference published reports. The referred links are hereby attached.

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Discovering Actionable Knowledge through Top-K High Utility Item sets for Expert Decision Making

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Abstract

Association rule mining (ARM) is widely used mechanism in data mining to discover trends from databases. There are plethora of ARM algorithms available for frequent itemset mining and generating association rules. This paper makes a comparative study of important ARM algorithms such as Apriori, FP-Growth, LCM and FIN. Out of them FIN is the most recent algorithm and fast in generating frequent item sets. LCM is an award winning algorithm. FP-Growth algorithm generates frequent itemsets without candidate generation approach followed by Apriori. Due to their significant differences, these algorithms are chosen for comparative study. This paper provides the details of the algorithms, illustrations to have deeper insights besides comparing them in terms of performance measures like execution time and memory consumption.

Keywords: *Data mining, frequent itemset mining, FP-Growth, Apriori, LCM, FIN*

1. INTRODUCTION

Due to the increase of data and in fact its exponential growth in many industries and organizations, it became essential to have automated data analysis to make business decisions. This need paved way for data mining which is the process of discovering trends or patterns from databases. These trends or patterns are latent in databases. They are used by domain experts to have business intelligence. Many data mining techniques such as clustering, classification, association rule mining etc. came into existence. Association rule mining is one of the widely used data mining algorithms to study trends or patterns in data. By mining data ARM algorithms provide rules that can help in understanding the behaviour of customers for instance.

In early days of ARM research contributions are found in [5], [6], [7], [8] and [9] to mention few. ARM is widely used in different applications such as intrusion detection [10], loss profit estimation [11] and market basket analysis to mention few. Different approache in association rule mining are explored in [12], [13], [14], [15], and [16]. However, this paper focuses on the comparative study four algorithms that have different significance. They are known as Apriori [1], FP-Growth [2], LCMFreq [3] and FIN [4]. These algorithms exhibit different features. For instance, apriori algorithm uses candidate generation phase which does

not exist in FP-growth. LCMFreq is an award winning frequent itemset mining algorithm in 2004 while FIN is the fast algorithm that makes use of Nodesets and POC tree as underlying mechanisms for speeding up the process of generating frequent item sets.
This paper presents comparative study of the aforementioned algorithms. It covers the purpose and mechanisms employed by each algorithm. The illustrations provided in this paper give deeper insight on the functioning of the algorithms. Experiments are made with these algorithms and the results are observed in terms of execution time and memory consumption besides patterns generated by them. Mushroom dataset collected from UCI [17] machine learning repository is used to perform experiments in a PC with 4 GB RAM, 1.70 GHz CPU, running 64 bit Windows 10 operating system. Dataset is divided into two parts. First part contains 565 KB of data while the second part has 1130 KB of data. Initial experiments revealed that size of data has it influence on execution time and memory consumption of the four algorithms.
The remainder of the paper is structured as follows. Section 2 provides information about association rule mining in general. Section 3 presents the functioning of Apriori algorithm. Section 4 presents the working details of FP-Growth algorithm. Section 5 provides information about LCM algorithm and its way of generating frequent item sets. Section 6 present the functioning of FIN algorithm. Section 7 throws light into the comparative study of the algorithms while section 8 concludes the paper besides providing directions for future work.

2.RELATED WORK

Agarwal et al. [1] proposed the concept of association rules and algorithms for database management system.Ahmed et al. [2] given the efficient tree structures which are helpful for utility pattern mining in incremental databases.In this he described the construction process of IHUPL-Treestructure in which how the items are arranged in lexicographic order.Chuang et al. [3] described the concept for memory constraint, mining top-k frequent patterns used for memory constraint. For this he used an algorithm named as native to discover top-k frequent itemsets.He also given illustration of mining frequent items under the memory constraint for various database scan of support distribution plot and perspective of candidate generation.Chan et al. [4] proposed mining high utility itemsets for traditional association rules in the data mining.Viger and Tseng [5]proposed top-k sequential rules for better understanding of data in the database.For this he proposed an algorithm named TopSeqRules,a top-k algorithm based on the search strategy in the data mining.Wu et al. [6] given the mining top-k association rules for datamining.For the generation of rules, he proposed algorithm “Top K Rules” takes as input a transaction database, a number k of rules that the user wants to discover minconf threshold.Viger et al. [7] given non concise representations for high utility itemsets which are using in generator patterns.For this they proposed two algorithms named as GHUI-Miner and HUG-Miner.
Han et al. [8] given frequent patterns without candidate generation for decreasing the cost.For that he given a tree structure (FP-Tree) which is an extended tree structure for storing the information in compression format,crucial information about frequent patterns.For this he given a transaction database for proposing this concept.Han et al. [9] proposed the mining task “mining top-k frequent closed patterns” is developed for mining such patterns without minimum support.For that he proposed two methods closed_node_count and descendent_sumis proposed to effectively support threshold and prune.They also given the diagram for verification of two-level indexing of closed patterns.Krishnamoorthy[10] given pruning strategies for mining high utility itemsets.External utilities like margins and profits etc. to discover patterns from a transactional database.It is also an extension of mining

problem relating frequent itemset.He used HUP-Miner algorithm for proving the results.He proposed the runtime performance and percentage reduction of results for comparatively.And proposed the difference of sparse datasets and dense datasets.Lin et al. [11] proposed efficient updating high-utility datasets for transaction deletion in dynamic databases.Many algorithms are relating to association rules are designed for frequent itemsets for a binary dataset.Here the other factors like Cost,Profit and quantity are not relating for the binary databases.They gave the experimental results show that proposed algorithm performs in maintaining high utility itemsets.For this he also given an example to illustrate the process step by step.They also given the comparison of graphs for execution time for minimum utility thresholds and deleted transactions in simulated database.

Lan et al. [12] proposed that high utility sequential pattern mining to apply the maximum utility measure.Utility sequential pattern mining has been an emerging popular due to consideration of different measures like quantity,profit and time order of times.They developed indexing strategy to quickly find the relative sequences for prefixes in mining and thus to reduce the unnecessary time for searching.Finally given the experimental results for different datasets show the good performance through the proposed algorithm compared to previous algorithms.Quang et al. [19] proposed an efficient algorithm for mining top-k frequent patterns called "Ex-Miner.This is combined with the idea of "build once and mine anytime" to frequent patterns sequentially.Here also given experimental results for comparison on synthetic and real data show that the proposed algorithm are more comfort compare to existing algorithms.

Ryang et al. [20] proposed the effective threshold raising strategies using top-k high utility pattern mining.In pattern mining users generally set a minimum threshold to find efficient patterns from database.Patterns with high values than the user given values discovered.This is hard for the users to find the minimum appropriate threshold values.Here the reason that the users cannot predict the number of patterns are mining by the threshold.Here they suggest the strategy for identifying actual top-k utility patterns from candidates with the exact and pre-calculated utilities.They given experimental results for both datasets .Ryang et al[21] discovered the high utility item sets with multiple minimum supports. Actually, association rule mining use only for single minimum support threshold for whole database.

Generally all items have same nature in the database. But in real applications each item can have different nature such as medical datasets which contains information for both diseases and symptoms or status related to diseases. Association rule mining with multiple minimum support discovers items relate to their characteristics. This model can identify meaning ful rules including item rules. In this they proposed new novel tree structure called MHU-Tree which is constructed with single scan. Moreover, a new algorithm named MHU-Growth for mining high utility item sets with multiple minimum supports. They given experimental results and shown that MHU-Growth performs efficiently to compare previous algorithms. Shie et al[22] given the mobile sequential patterns which is used in mobile commerce environment. Previous researches combined moving paths and purchase transactions to find mobile sequential patterns. Actually these patterns cannot reflect the actual profits of items in transactional databases. In this they explore a new problem of mining high utility mobile sequential patterns integrating with mobile data mining with utility data mining. Here two methods are given for mobile sequential patterns .A series of analysis on the performance of the two algorithms are conducted through experimental calculations. And finally clarified that the proposed algorithms gave better performance in some situations.

Tseng et al[24] proposed an efficient algorithm for high utility item set mining named as UP-Growth. Mining high utility item sets from a transactional database refer to the discovery of item sets with high utility like profits. Large number of candidate datasets given the low mining performance interims of execution time and space requirement for execution. The

situation become difficult when the database contains long transactions or long utility item sets. To overcome the problem proposed the new algorithm for mining high utility item sets with a set of techniques for pruning candidate item sets. The information of high utility item sets are maintained in a special data structure called Utility Pattern Tree such that the datasets can be generated efficiently with two scans of database. The performance of UP-Growth was computed in comparison with the state-of-the-art algorithms. The proposed algorithm reduces the number of candidates efficiently and outperforms other algorithms in terms of different categories like execution time especially when the database contains long transactions.

Tseng et all[25] proposed efficient algorithms for mining the concise and loose less representation of high utility item sets. Mining high utility item sets from the databases is some important task in data mining which refers the discovery of item sets with high utilities. To achieve the high efficiency for the mining task to provide concise mining result to users. Wang et al. [27] proposed an efficient algorithm for top-k frequent closed item sets is TFP. This algorithm is developed without mins_support. Starting mins_support is 0 and by making of length constraint and the properties of top-k closed item sets mins_support raised effectively. Moreover, mining speed will be increased by applying top-down and bottom-up combined FP-Tree traversing strategy.TFP has high performance and linear scalability in terms of the size of the database.

3. APRIORI ALGORITHM

The Apriori algorithm is a basic algorithm for finding frequent itemsets from a set of data by using candidate generation. Apriori uses an iterative approach known as a level-wise search because the *k*-itemsets is used to determine the (*k* + 1)-itemsets. The search begins for the set of frequent 1-itemsets denoted L_1. L_1 is then used to find the set of frequent 2-iemsets, L_2. L_2 is then used to find L_3 and so on. This continues until no more frequent *k*-itemsets can be found.

To improve efficiency of a level-wise generation the Apriori algorithm uses the Apriori property. The Apriori property states that all nonempty subsets of a frequent itemset are also a frequent itemsets. So, if {A, B} is a frequent itemset then subsets {A} and {B} are also frequent itemsets. The level-wise search uses this Apriori property when stepping from level to the next. If an itemset*I* does not satisfy the minimal support then *I* will not be considered a frequent itemset. If item *A* is added to the itemset*I* then the new itemset$I \cup A$ cannot occur more frequently than the original itemset*I*. If an itemset fails to be considered a frequent itemset then all supersets of that itemset will also fail that same test. The Apriori algorithm uses this property to decrease the number of itemsets in the candidate list therefore optimizing search time. As the Apriori algorithm steps from finding L_{k-1} to finding L_k it uses a two-step process consisting of the Join Step and the Prune Step.

4.EXPERIMENTAL RESULTS

This section provides results of experiments made with the four algorithms. The execution time and the memory consumption are the two important observations. Mushroom dataset with different size is used for evaluating the algorithms.

Execution Time Comparison

Algorithm	Execution time (sec) with 565 KB dataset	Execution time (sec) with 1130 KB dataset
LCM	17	35
FP-Growth	0.15	0.35
FIN	0.271	0.291
Apriori	0.533	1.069

Table 1: Execution time of different file sizes for different algorithms

Table 1 shows values of different files for different algorithms which is having higher performance and which is having lower performance.The above table describes the FP Growth algorithm contains the less execution time. To compare the remaining algorithm execution time 565 kb file the FP Growth gives the better performance. The Execution of FP Growth 1130 kb file is 0.15. For 1130 kb file, Fin algorithm contains less execution time. To compare the remaining algorithm execution time Fin algorithm gives the better performance. The Execution of Fin 1130 kb file is 0.291.LCM has the least performance of both file sizes to compare remaining algorithms. The execution time of file size 565 kb is 17. Execution time of file size 1130 kb is 35.

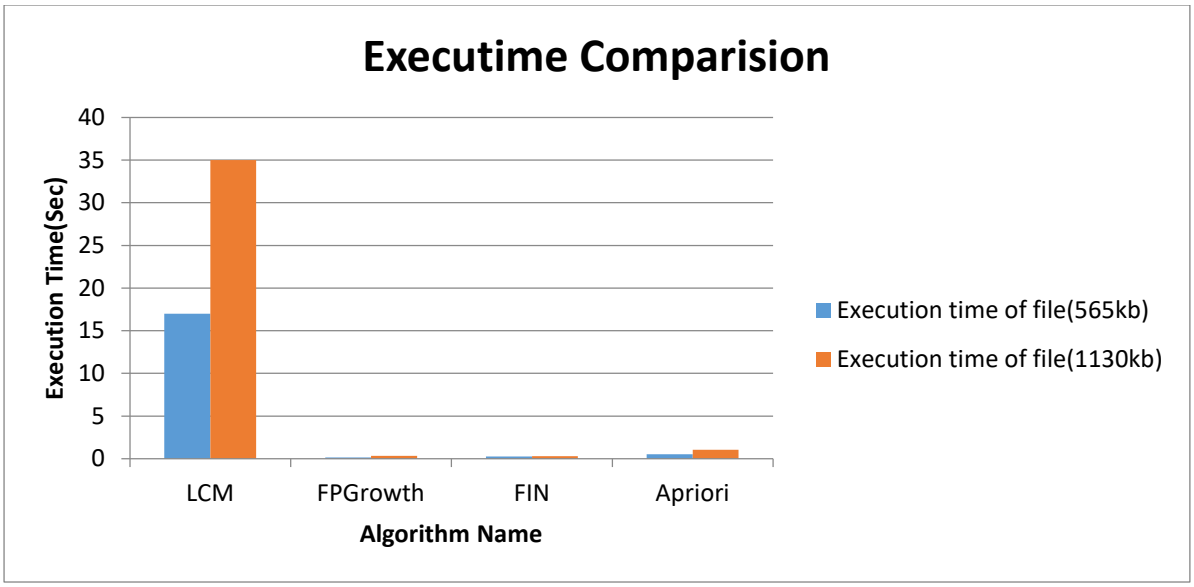

Figure 1: Comparison of execution time in different Algorithms

The above Graph describes the FP Growth algorithm contains the less execution time. To compare the remaining algorithm execution time 565 kb file the FP Growth gives the better performance. The Execution of FP Growth 1130 kb file is 0.15. For 1130 kb file, Fin algorithm contains less execution time. To compare the remaining algorithm execution time Fin algorithm gives the better performance. The Execution of Fin 1130 kb file is 0.291.LCM

has the least performance of both file sizes to compare remaining algorithms. The execution time of file size 565 kb is 17. Execution time of file size 1130 kb is 35.

Memory Usage

Algorithm	Memory Consumption (MB) with 565 KB Dataset	Memory Consumption (MB) with 1130 KB Dataset
LCM	15.3175	15.4523
FP-Growth	1.8211	2.7463
FIN	42.8377	44.1514
Apriori	7.12781	8.8062

Table 2: Memory values of different file sizes for different algorithms

Table 5 shows values of different files for different algorithms which is having higher performance and which is having lower performance.The above table describes that FP Growth algorithm gives the better performance of both different size of files to compare the other algorithms. The memory usage of file 565 kb is 1.8211. Execution time of file 1130 kb is 2.7463.FIN algorithm gives least performance of both different size of files to compare the other algorithms. Execution time of file size 565 kb is 42.8377. Execution time of file size 1130 kb is 44.1514.

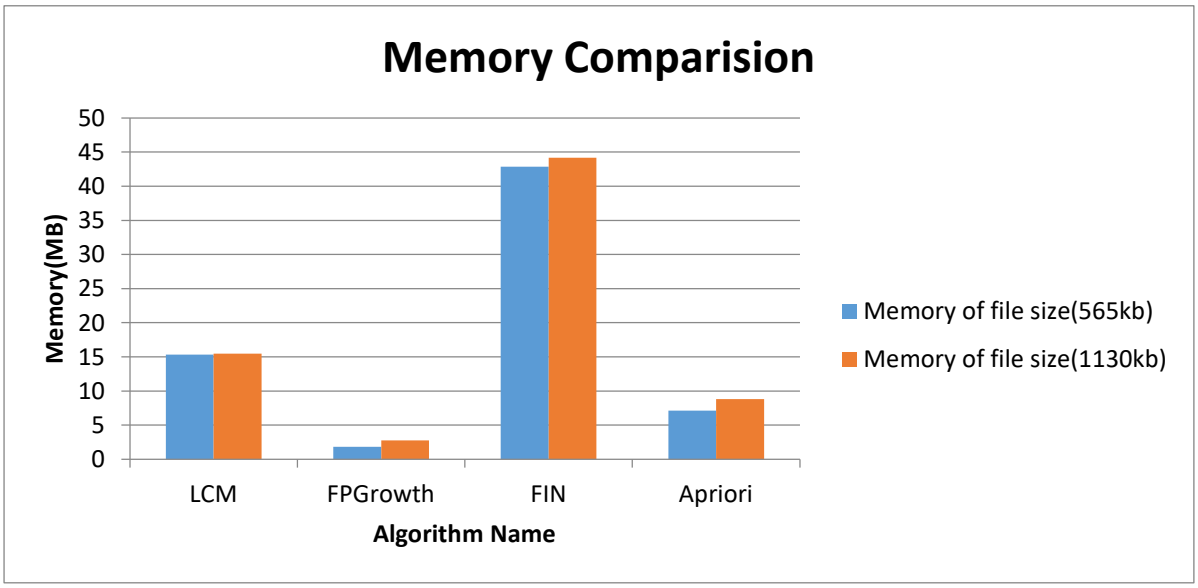

Figure 2: Comparison of Memory in different algorithms

The results shown in Figure 4 reveal that FP Growth algorithm gives the better performance of both different sizes of files to compare the other algorithms. The memory usage of file 565 kb is 1.8211. Execution time of file 1130 kb is 2.7463.FIN algorithm gives least performance of both different size of files to compare the other algorithms. Execution time of file size 565 kb is 42.8377. Execution time of file size 1130 kb is 44.1514.

6. CONCLUSIONS AND FUTURE WORK

This paper explored knowledge discovery with four frequent item set mining algorithms namely Apriori, FP-Growth, LCM and FIN. These algorithms are explored in terms of their functionality, the way they generate frequent item sets and their performance. The performance of the algorithms is analyzed with an empirical study in terms of execution time taken and the memory consumed by the algorithms. Mushroom dataset collected from UCI machine learning repository is used for experiments. The dataset is modified to have two versions with 565 KB and 1130 KB respectively. The experimental results revealed that the size of data has its influence on the execution time and memory consumption of the algorithms. FIN algorithm shows least execution time while FP-Growth showed least memory consumption. Nevertheless, it is to be understood that there are limitations in the study. Further investigation is required to have more insights and evaluations. In addition to this, in future, we intend to work on the automatic update of association rules when underlying dataset is subjected to changes.

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A STUDY ON SAVINGS AND INVESTMENT HABITS OF WORKING WOMEN

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Abstract

Savings and investment habits of women are changing in the present-day scenario. Women want to be financially independent and secure. They want to invest their money and save it to handle a critical situation at any stage of their life. Women plan to invest because they want to be independent and live their life happily, securely and peacefully even after the retirement. Also proper investment helps the family to handle the financial situation in future. Present research paper tries to explore the factors influence the savings and investment habits of working women and also tries to find out the best investment avenue from working women point of view.

Keywords: *Savings, Types of Investment, working women, Investment habits of women.*

1 INTRODUCTION

Every person has to work to earn money to meet their needs. Different persons choose different jobs. Some choose business and some choose employment as their livelihood. Out of their earnings people meet their needs and wants. Also they save and invest money to meet their future needs. Properly invested money gives security and better returns which gives a better future. The term Investment is that part of money which is invested in security or property with an aim to earn future returns. There are different types of investment such as fixed deposits, real estate, gold, post office saving schemes, bonds and shares etc.The present study focuses on the perception of female investors towards saving objectives, investment risk and preferred investment choice**.**

1.1 Meaning :

Investment is planned commitment of funds from a person's savings into different outlets with the expectation of safe, stable and fare return. Investment is an activity that is engaged in by people who have savings, i.e. investments are made from savings, or in other words, people invest their savings .But all savers are not investor's . The economist understands the term 'Investment' as net additions to the economy's capital stock which consists of goods and services that are used in the production of other goods and services. For them, the term investment implies the formation of new and productive capital in the form of new construction, new producers' durable equipment such as plant and equipment, including inventories and human capital.

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1.2 Types of investments

The following are the various types of investments one can consider.

• Stocks: It is a place where shares of pubic listed companies are traded. The primary market is where companies float shares to the general public in an initial public offering (IPO) to raise capital.

• Bonds: A bond is a loan an investor makes to a corporation, government, federal agency or other organization in exchange for interest payments over a specified term plus repayment of principal at the bond's maturity date. There are a wide variety of bonds including Treasuries, agency bonds, corporate bonds, municipal bonds and more.

• Real Estate: Real estate is property consisting of land and the buildings on it, along with its natural resources such as crops, minerals or water; immovable property of this nature; an interest vested in this (also) an item of real property, (more generally) buildings or housing in general.

• Gold: Gold is placed in high regard as an investment. Due to some influencing factors such as high liquidity and inflation-beating capacity, gold is one of the most preferred investments in India. Gold investment can be done in many forms like buying jewellery, coins, bars, gold exchange traded funds, gold funds, sovereign gold bonds scheme etc.

• Mutual Funds: It is a trust that collects money from a number of investors who share a common investment objective. Then, it invests the money in equities, bonds, money market instruments and/or other securities.

• Deposits: Deposit's investments include everyday bank accounts, with a high interest in savings accounts and in terms of deposits. They offer no chance of capital growth; they can deliver regular income and can play an important role in protecting wealth and reducing risk in a investment portfolio.

• Fixed interest: The best-known type of fixed interest investments are bonds, which are essentially when governments or companies borrow money from investors and pay them a rate of interest in return.

• Growth investments: Growth investment is more suitable for long term investors as they can help growing the willing and able to withstand markets ups and downs.

• Exchange-Traded Funds: ETF (Exchange Traded Funds) are a type of index funds. They track a benchmark index and aim to mirror those performances. Like mutual funds, they tend to be cheaper than mutual funds because they are not actively managed.

1.3 Investment in India

Investment is to allocate money in the expectation of some benefit or return in the future. In other words, to invest means owning an asset or an item with the goal of generating income from the investment or the appreciation of your investment this is an increase in the value of the asset over a period of time. When you invest it always requires a sacrifice of some present asset that you own today such as time, money, or effort.

In today's changing scenario women want to actively participate in all activities which are related to education, politics, science and technology etc. Women are multi taskers as they can manage both household work and professional life unlike men. They want to be financially independent and enjoy their freedom so they can live a happy and secured life. Although women's income has been considered as a supplement income within the

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family, now a days there are various investment options for working women such as gold, real-estate, government bonds, share markets, mutual funds post services etc. Younger women start investing in their 20's so they can live a luxury life after their retirement and save the money for situation in future or for their children and family. Hence the behaviour of each working women is different as they go for a non risky investment which is risk free and get a good return of investment.

1.4 WHY DO PEOPLE INVEST

Investing allows you to put your money in vehicles that have the potential to earn strong rates of return. It helps you in increasing your wealth and become rich. Most investment vehicles, such as stocks, certificates of deposit, or bonds, offer returns on your money over the long term. This return allows your money to build, creating wealth over time. As you are a working woman you must save your money for retirement your saved money in portfolio of investment such as bonds, stocks, mutual funds, real estates, growth investment, fixed interest etc. Investment for working women can also help in building up their career and creating wealth over time. If your money is earning a higher rate of return than a savings account, you will be earning more money both over the long term and within a faster period. This return on your investments can be used toward major financial goals, such as buying a home, buying a car, starting your own business, or for children' education.

1.5 LITERATURE REVIEW

- **According to prof. PriyaVasagadekar's (2014)**: A study on saving habits among fixed income of women states that working women in India wants to increase their wealth as it has become a present day need for working women in India, they prefer to invest their money in fixed deposits, gold, real estate, government bonds etc.
- **According to Rajeshwari Jain research (2014)** "Women are more curious in making investment they prefer fixed deposits bank a safer way to invest their money without any risk to be taken they also prefer gold as a good way to invest their money.
- **According to Krishnamoorthy (2006):** In his studies he analyzes the profile and awareness of working women and their attitude and satisfaction towards investment. It has been concluded that all salaried people were aware of bank deposits schemes, insurance scheme, post office saving scheme and gold etc.
- **According to Bahl (2009)** "A study on Investment behaviour of working women concluded that 33 % of the women have a well-developed plan for investment. It also infers that 48 % of the working women think that one should start to invest whenever they find a new job or occupation. 18 % of the working women have invested in shares & stocks.
- **According to Dr. Y.V. Ramona Murthy Research (2018)** In his studies he states that women are becoming financially independent and not depending on their family or husbands for any sort of investment. They prefer to invest the money in gold, real estates and fixed deposits which are going to help. Saving and investing the money has become a vital part of our life so it can lead us to a happy and peaceful life with a full pocket of money.

1.6 NEED OF THE STUDY

The need of this study is to know the savings and investment habits of women and to analyze the behaviour that influence the female investors to invest their money without any risk involved in it.

1.7 OBJECTIVES

- To examine the savings and investment habits of women.
- To analyse the most preferred investment option available to the female investors.

2.RESEARCH METHODOLOGY

- Sources of data:
- Primary data is collected through administering the questionnaire.
- Secondary data is collected through various text books, articles, published sources and e-source.
- The target population of this study is working women of Hyderabad, Telangana State.101 working women were selected from different sectors both from public and private sectors using simple random sampling.
- Responses were analysed using arithmetic mean.

2.1 SCOPE AND LIMITATIONS OF THE STUDY

- The study is limited to the city of Hyderabad
- The study is based on the responses 101 responses of working women.
- The responses received don't claim the completeness and total accuracy in its findings. Hence biased results are likely to creep.

3. FINDINGS

The following are the findings of the study conducted on 101 working women.

- It is found that 44.6% of women have an annual income below 100000,20.8% have an annual income of Rs.100000-300000, 15.8% have an annual income of Rs.300000-500000 and 18.8% of women haven annual income above 500000.

- 86.1% of women save their money for future requirements and 13.9% of women do not save their money they may be like to spend it on themselves or maybe for their family.
- The best saving options for 46.5% of women is bank fixed deposits, 14.9% of women plan for an insurance, 24.8% of women like to invest their money in gold, 12.9% of women use the national pension scheme and the others like the Foreign Direct Investment (FID) options.
- 72.3% of women like to invest their money for a current growth of incomes and 27.7% of women do not invest their money.
- The best investment options for 16.8% of women are mutual funds, 15.8% of women invest their money in real estate, 18.8% of women invest in stock market because they like to take risk 28.7% of women keep their money banks for saving it, 18.8% of women invest in gold and others like to invest it in FDI (Foreign Direct Investment).

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- It is identified that the factors that influence women to invest their money 25.7% of are influence by attractive interested rates which gives a good return, 22.8% of women want a current growth of income, 31.7% of women wants to reach their finance goals and 19.8% of women save their money retirement purpose.
- 54.5% of women are risk lovers and 45.5% of women are risk averse.
- When asked what time period you prefer for investment of money, 45.5% of women like short term investment and 54.5% of women like long term investment of money.
- Also it is found that 67.3% of women like to invest their money in share markets through D- mat account and 32.7% of women do not invest their money.
- The objectives of investment 13.9% of women like income and capital preservation, 35.6% of women investing objectives is for long term growth, 28.7% of women investment for the growth and income and 21.3% of women invest for short term growth.
- It is found that 95%women think that there is a difference between savings and investment and 5% of women think there is no difference between savings and investment.

3.1 SUGGESTIONS

- In my opinion I believe that working women have changed their lifestyle by believing in investment of money and saving the money for investment for a good rate of return. A proper financial planning can help in achievements of various goals.
- Women can take care of their household work and even do a job they are good in time management. Secondly government should start awareness for working women in the idea for investment of money and encourage them to invest it.
- Women can take help of reliable Certified Financial Planners for making the right investment decisions & for having an ideal portfolio sound financial plan must include the planning of short, medium- & long-term goals and deciding the timeframe for achieving these goals by developing a formal written.
- It can be done by evaluation our current assets and current liabilities and try more in investment of our assets.
- This can help in better decision making have a good open mind about everything and can be really helpful if we take care of our money in a right way so we can increase our current income achieve our future goals and future needs. I think women are not dependent on their husbands or family for money because they know how to earn it.

3.2 CONCLUSION

This research was conducted to determine the savings and investment habits of women in India. Working women have changed their habits towards investment and started to invest their money for their achievements and future goals. Women are no less than men in investment of money they know things related to investments and savings of money like where to invest, how to invest, when to invest, what to invest and how much to invest when you are a beginner in investment of money by have in a proper knowledge about it. Women invest their

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money for their family, children, for themselves, to fulfill their various goals and some for retirement and even because money is everything in today's changing scenario.

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