Analysis of Health Parameters and related Life Style in Girls: A Survey

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The health issue is the major concern for every human being as most of the people do not know the exact disease and its causes**.** This study was conducted to see the cause of unhealthy lifestyles in girls**.**In this paper, we examine the factors affecting the Healthy Lifestyle of Girls by using different methods**.** We defined the cause of unhealthy lifestyle in girls by collecting the data related to their normal lifestyle by doing survey.Multiple methods were used to predict cause of unhealthy lifestyle, which includedrecurrent neural network (RNN), Naïve Bayes, Decision tree and support vector in this paper.

1. Introduction

In terms of healthy eating this framework is used to examine the extent to which adolescents' intention for healthy eating is affected by the extent to which they have a favorable or unfavorable evaluation of engaging in eating healthy, how easy or difficult they perceive eating healthily to be, and the extent to which they think significant others want them to eat
healthily.

According to the World Health Organization (WHO), overweight and obesity pose significant health problems for adults as well as for children and adolescents (World Health Organization, 2012). For children, the risks include breathing difficulties, increased risk of fractures, hypertension, early markers of cardiovascular disease, insulin resistance and psychological problems. In addition, childhood obesity increases the risks of premature death and disability in adulthood, and the earlier overweight and obesity problem arise, the higher the risk of health problems (World Health Organization, 2012). The prevalence of adolescents' overweight and obesity in the developed countries has increased dramatically and in Europe, more than 30% of all European children are overweight or obese (European Commission, 2007).

2. Related Research:

Dieting is a diffuse construct that encompasses behaviors and strategies that may either promote health or increase risk for health problems. Survey data have revealed that dieting for weight control is now normative among adult women and adolescent girls, and constitutes a multibillion-dollar industry in the United States today. The family is the primary social context for early socialization, and mothers play an important role in the development of young children's eating behavior . Maternal influence includes directly instructing children about food and eating , using child-feeding practices to control what and how

much children eat, and serving as models for children's eating. Mothers play a central role in transmitting cultural values regarding weight, shape, and appearance to daughters and mothers' own dieting and eating problems are linked to their daughters' dieting and eating problems .Although the former strategy is consistent with current dietary guidelines and should promote good health, chronic meal skipping may be problematic for children, and could place them at risk for problems of energy balance and eating disorders[2].

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Previous studies have documented that adolescents have problems in understanding as well as in practicing healthy eating behaviors. For example, qualitative studies have found that early adolescents have a limited understanding of what constitutes healthy eating, whereas their understanding of what constitute unhealthy eating is much better (Power et al., 2010; Stevenson et al., 2007). With regard to behavior, several international studies attest to the fact that adolescents' diets generally do not live up to national health recommendations

3. Machine Learning Methods for Analysis of Lifestyle

Here we will be experimenting some of the machine learning algorithms to get a detailed idea about the methods for the risk prediction.

3.1 **Naive Bayesian (NB)** Bayes strategies are a lot of directed learning calculations dependent on applying Bayes' hypothesis with the "innocent" supposition of restrictive autonomy between each pair of highlights given the estimation of the class variable. Bayes' hypothesis expresses the accompanying relationship, given class variable A and B ward highlight vector x1 through xn.

$$P(A/B) = \frac{P(B/A) \times P(A)}{P(B)} \qquad (7)$$

Naive Bayes classifiers have worked great in some genuine circumstances, broadly record characterization and spam separating. They require a little measure of preparing information to assess the important parameters. (For hypothetical reasons why guile less Bayes functions admirably, and on which sorts of information it does, see the references underneath.) with progressively complex strategies. The decoupling of the class contingent component conveyances implies that every dissemination can be autonomously assessed as a one dimensional circulation. This thus mitigates issues originating from the scourge of dimensionality.

In below fig the performance the algorithm is given, where 5 set of training is done and results are compared respectively. Each time their true positive(TP) ,false positive(FP) ,precision and recall also calculated[4].

3.2 **Decision Tree (DT)** It is a Segregation of given input based upon their features. From the given input the output is classified based on the maximum depth of the problem. The depth can be given manually, but to find the best depth they run as a loop and best depth with high accuracy is taken. Some times there

is a chance of overfitting and underfitting of a model can happen according to the maximum depth of the model. **Under fitting** takes place when there is no proper information is provided. **Over fitting** takes place when model try to learn more data from the input.

Decision Tree Splitting- Decision tree is a graph to represent choices and their results in form of a tree. The model itself comprises a series of logical decisions, similar to a flowchart, with decision nodes that indicate a decision to be made on an attribute. For each split, two conclusions are made: the indicator variable utilized for the split, called the part factor, and the arrangement of qualities for the indicator variable (which are part between the left kid hub and the correct youngster hub), called the split point. The leaf hub, additionally called a terminal hub, contains a little subset of the perceptions and part proceeds until a leaf hub is built.

Pruning- The shortening of parts of the tree. Pruning is the way toward diminishing the measure of the tree by transforming some branch hubs into leaf hubs and expelling the leaf hubs under the first branch. Pruning is helpful in light of the fact that order trees may fit the preparation information well, yet may complete poor employment of arranging new qualities. Lower branches might be emphatically influenced by anomalies. Pruning empowers you to locate the following biggest tree and limit the issue. A less difficult tree frequently avoids over-fitting.

Tree selection- The way toward finding the smallest tree that fits the information. Generally, this is the tree that yields the least cross-approved mistake. See the clarification for a cross-approval blunder in Output From Decision Trees.

3.3 **Support Vector Machine (SVM)** SVM algorithm makes an axis over the plots and separates different features obtained from the plain. According to a number of different features present they separated respectively. When the two different objects are placed over the plan$e then they are separated according to their features extraction. There are three types of SVM namely; Linear, Poly and RBF.

SVM Type I is a linear method a linear line is placed from which different features are extracted using the given formula,

$$\frac{1}{2}WTW + C\sum_{i=1}^{N} = 1\varsigma i$$

SVM Type 2 is a Poly method a circular or irregular shape is drawn over the x and y axis and features are extracted using the given formula,

$$\frac{1}{2}WTW - \nu\rho + \frac{1}{N}\sum_{i=1}^{N} = 1\varsigma i$$

3.4 **Recurrent Neural Network (RNN)** The basic idea of recurrent networks is to have loops. These loops are allowed to use information fromprevious passes in a network. The memory length depends on a number of factors but to note that it is not an indefinite loop. You can think of the memory as degrading, with older information[19] being less and less usable. For example, if we just want the network to do one thing they remember whether an input from earlier was 1, or 0. In a network it is not difficult for a network to remember whether the previous output was 1 around the loop continuously. However

every time you send in a 0, then the output can become somewhat lower. After some number of passes the input loop which will be arbitrarily low, making the output of the network as 0.

RNN Formula $h(t) = f(h((t-1)\ x\ (t)\ ;0)$ (11)

Where, h(t) denotes current state, h(t-1) denotes previous state, x(t) denotes current input

Each time output from the previous state is given as the additional input to current state plus normal input is also given. Various hidden layers are given, based on constraints and how typical your model, number of hidden layers are decided. In this section, the overall result of the algorithms will be evaluated and analysed with the visual representation.

4. Sampling and data collection for proposed work

A cluster sample survey was conducted in feburary 2020. Different college girls students were invited to participate in the study. The questionnaires were self-administered in the classrooms. Altogether 300 questionnaires were distributed and the response rate was good at 83 percent. All aspects of the research procedure were conducted in Pune

4.1 Questionnaire and measurements

The questionnaire was based on simple lifestyle habitats. Information was collected about respondents eating habits, attitudes toward healthy eating, subjective norms as well as perceived behavioral control of healthy eating, and intention for healthy eating. Respondents were asked about their frequency of healthy eating practices (such as eating breakfast) or unhealthy eating practices (such as consuming fast foods or hard drinks) on a point scale (1.always or 2. occasionally).

- Meal Type: respondants were asked about the type of meal they have. It is classified into veg and nonveg.According to experts and studies, vegetarians happen to be leaner as compared to **non**-vegetarians. Not only this, vegetarians have a **healthier** BMI, controlled blood pressure and low cholesterol as well. Maintaining weight in a long run is easier if you are on a **vegetarian** diet.

- Frequency for sweet Consumption: It is classified into high, medium and low.The World Health Organization is dropping its **sugar intake recommendations** from 10 percent of your daily calorie **intake** to 5 percent. For an adult of a normal body mass index (BMI), that works out to about 6 teaspoons -- or 25 grams -- of **sugar** per day.

- Type Of Food Consumed In Non-Veg: They were classified into chicken, meat, egg, and Fish.Non-veg food is good for human beings. For example, the protein you get from veg food sources are incomplete but Overconsumption of red meat is not good for health as it contains saturated fats, that leads to heart disease.

- Duration of meal :The respondant have to describe the time in minutes.

- Type of Meal: Classification is done based on Frozen, Fresh ,Ready to eat or Stale.

- Type of lunch: Heavy or Light. Not everyone likes to eat a big breakfast. Although you shouldn't skip breakfast, some research shows that waiting until lunch to eat your largest meal may still be beneficial. A study published in the *International Journal of Obesity* in April 2013 found that people who ate the majority of their calories before 3 p.m. lost more weight than those who ate their main meal after 3 p.m. Both groups ate a similar number of calories throughout the day.

- Type of Dinner: Also classified into heavy and light. Although people may lose more weight when they make breakfast their largest meal, an earlier study published in the *Journal of Nutrition* in January 1997 found that those who make dinner their largest meal tend to have an easier time maintaining muscle mass while dieting. Making dinner your largest meal may help you lose more fat and less muscle, resulting in better overall body composition at the end of your diet.

- Water intake: It was classified into frequent,less in quantity, or adequate .The National Academies of Sciences, Engineering, and Medicine determined that an adequate daily fluid intake is:About 11.5 cups (2.7 liters) of fluids a day for women.

- Soft drink Consumption: Yes or No.

- Hard drinks Consumption :Yes or No.

- Frequency of taking hard drinks: Classified on a point scale of frequently or Ocassionally.

- Type of Exercise: Exercises were classified into different types like zoga, zumba, meditation, pranayama, Gymnasium, walking.

- Cause of doing the exercise: weather it is for weight loss or for weight gain.

- Timing of exercise: Morning, evening, or Night.The Journal of Physiology study found that **exercising** between 1 p.m. and 4 p.m. can shift forward your body clock in the same way as an early morning workout. Even taking a quick walk may help you perk up and refocus.

- Bedtime: early night or late night.

- Duration of sleep:It was classified in a time scale of 1-10.

- Type of sleep:Heavy or Light.The Sleeping habits recommended by WHO for young adult (18-25 years) should be 7 to 9 hours.

- In what form tension or pressure affects them: They were classified into Frequent headaches, frequent giddiness, anxiety, fear, sudden crying, depression, and pushing themselves to work.

5. Model Evaluation

Using this evaluation method accuracy of the model is known. Performance metrics of a model is calculated using the confusion matrix, which consists of true positive(TP), false positive(FP), true negative(TN), false negative(FN). We have four metrics such as accuracy, precision, recall, and F1-score are given below[4].

- TP- how correct the value is predicted as needed

- FP-how incorrect the value is predicted as needed
- TN-how correct the value is predicted a not needed
- FN-how incorrect the value is predicted as needed

$$Accuracy = \frac{TP + TN}{TP + TN + FP + FN}$$

$$Precision = \frac{TP}{TP + FP}$$

$$Recall = \frac{TP}{TP + FN}$$

$$F1 = \frac{2 \times Precision \times Recall}{Precision + Recall}$$

We also use another performance metrics such as ROC (Receiver Operating Curve), which is the curve drawn between True Positive (TP) and False Positive(FP) [4]

$$TPR = \frac{TP}{TP + FN}$$

$$TFR = \frac{FP}{FP + TN}$$

6. Result and Analysis

This are results are obtained by the survey

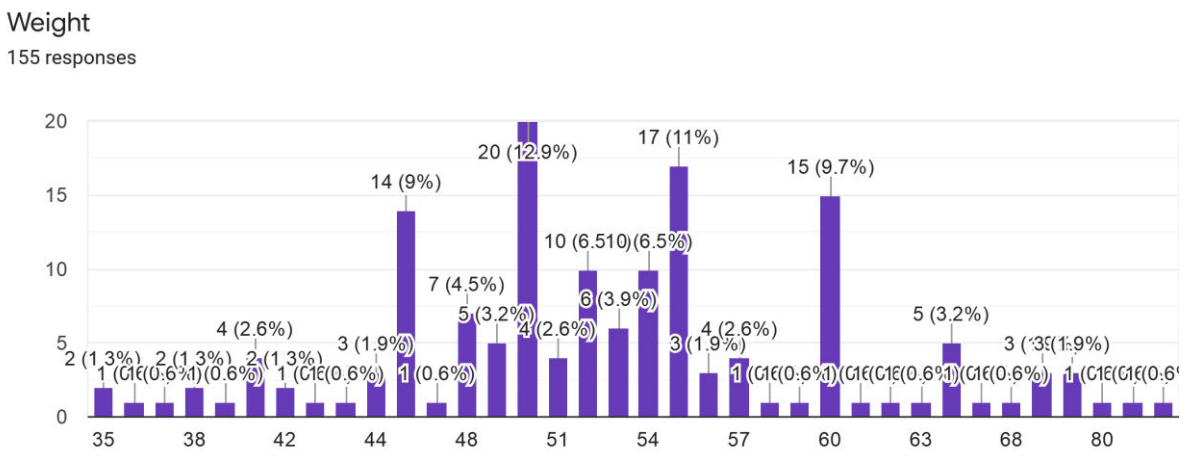

Fig 1: Weight

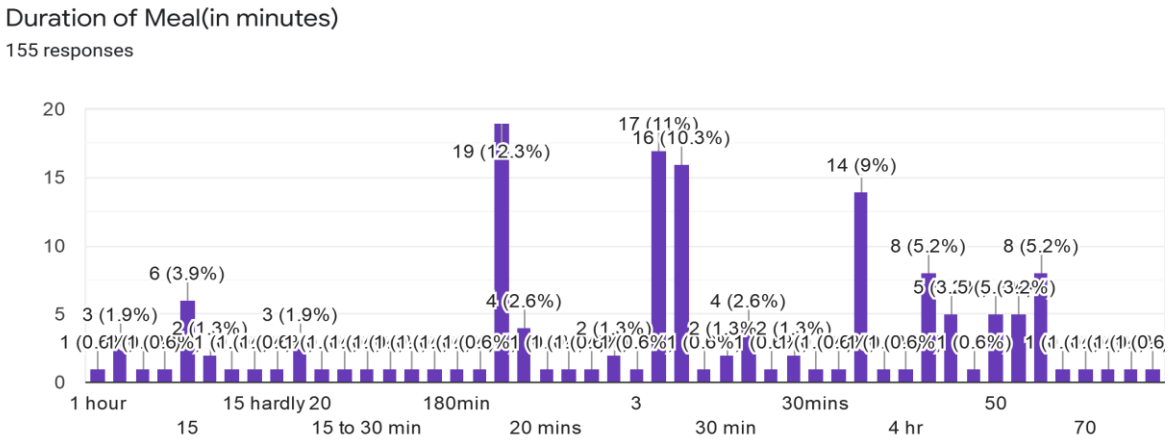

Fig 2: Duration of Meal

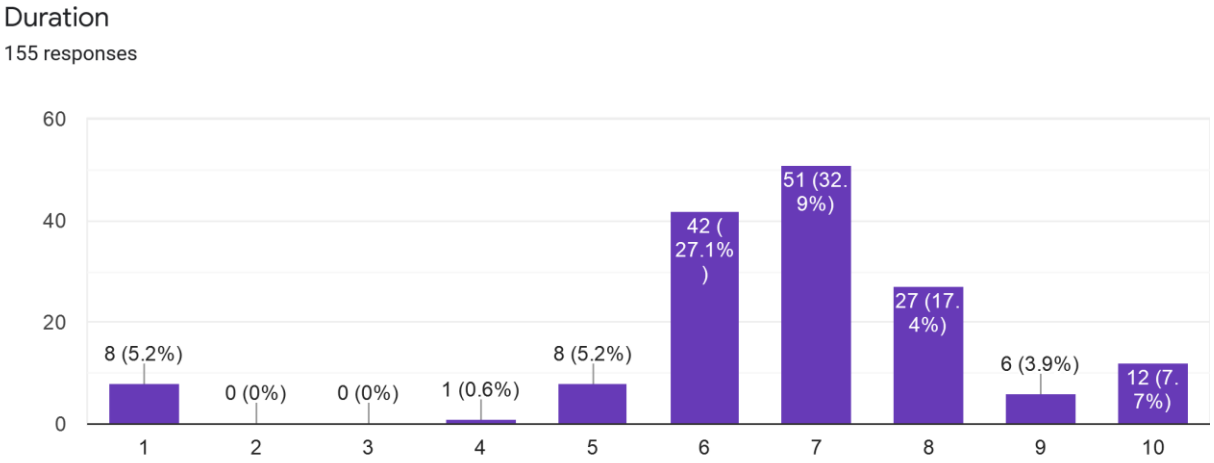

Fig 3:Duration

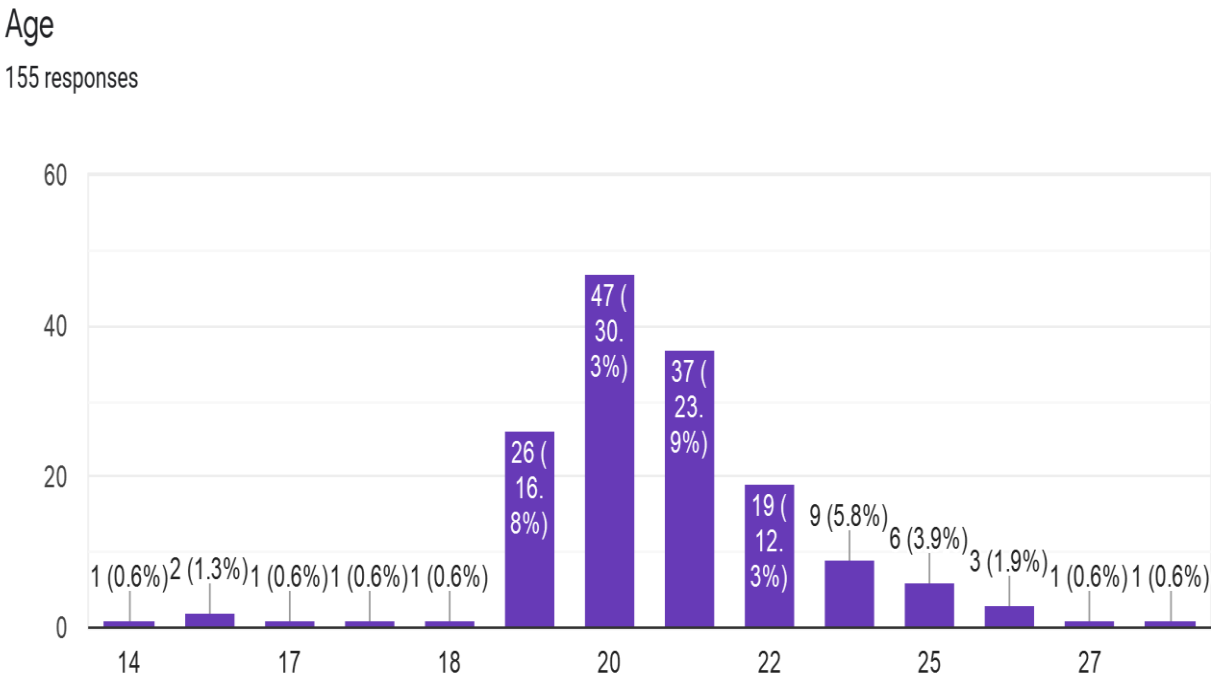

Fig 4:Age

Figure 3 shows duration of meal in minutes. It shows both percentage and number of people.

Figure 4 shows age of people. Age lies between 14 to 27. More people are between age 19 years to 22 years old. Only 6 people are having age lss than 19 and only 20 people are of age less than 22.

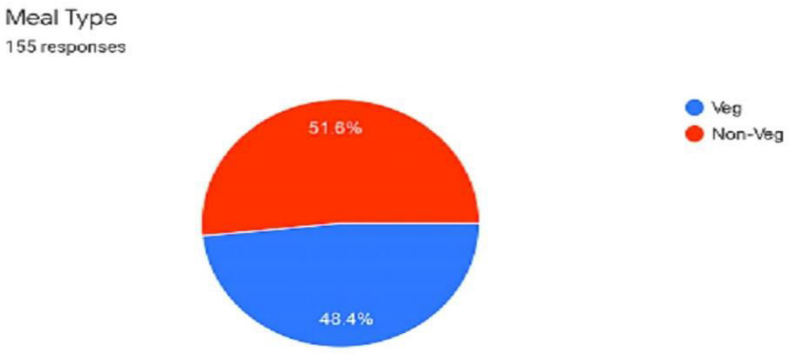

Fig 5: Meal Type

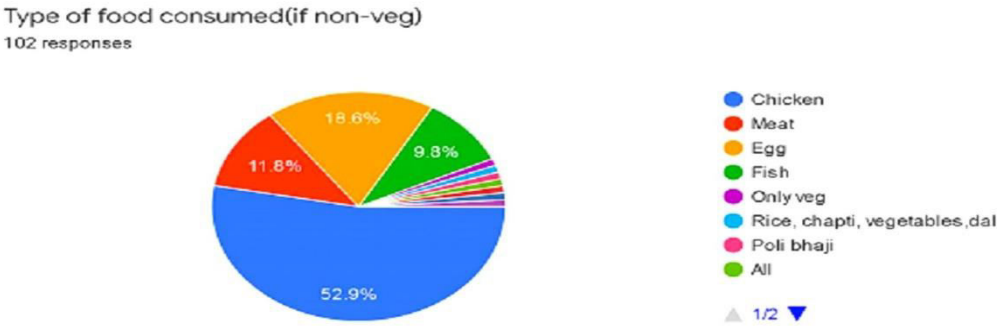

Fig 6:Type of food consumed

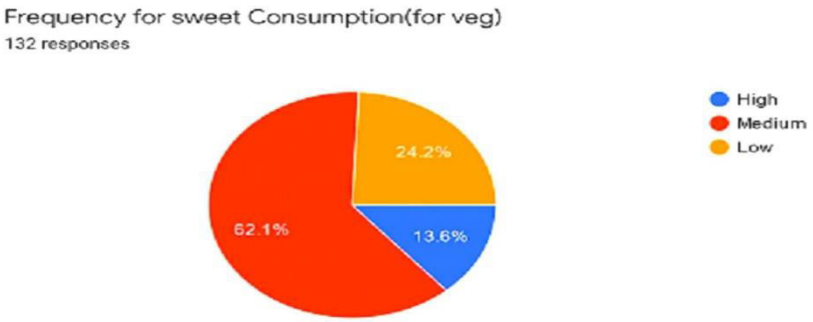

Fig 7:Frequency For sweet consumption

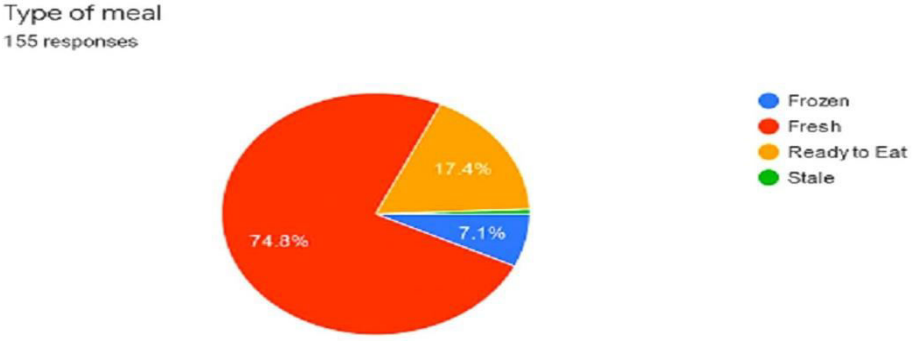

Fig 8:Type of meal

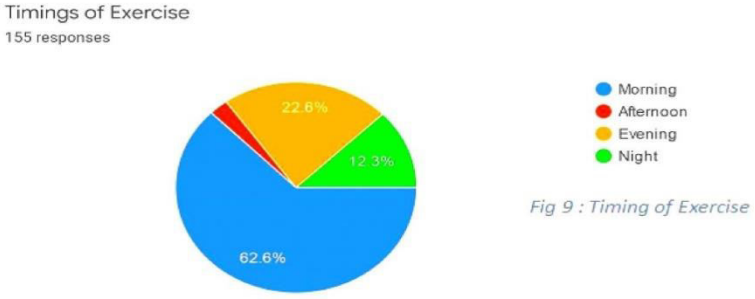

Fig 9 : Timing of Exercise

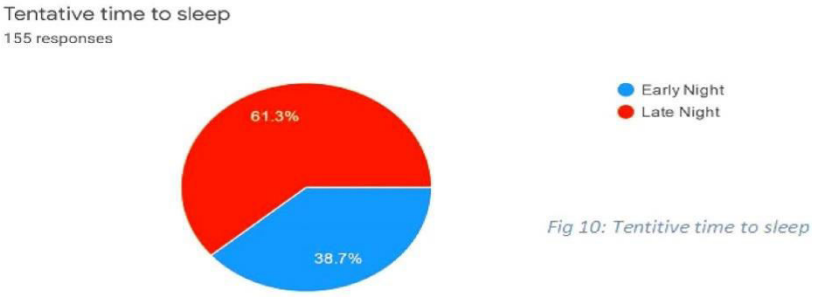

Fig 10: Tentitive time to sleep

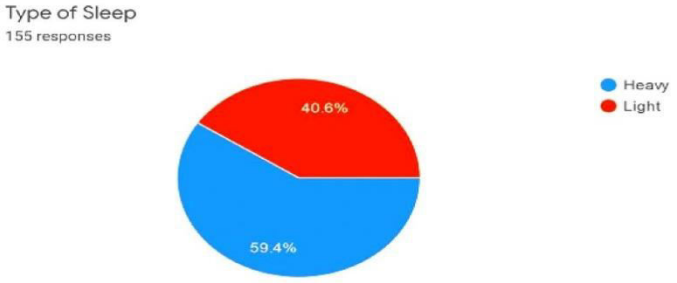

Fig 11 : Type of Sleep

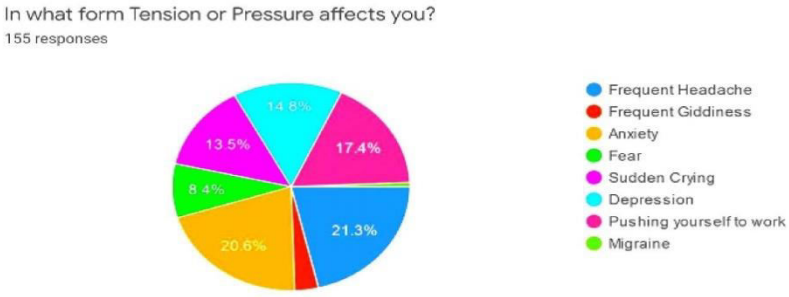

Fig 12 : In what form tension or pressure affects you

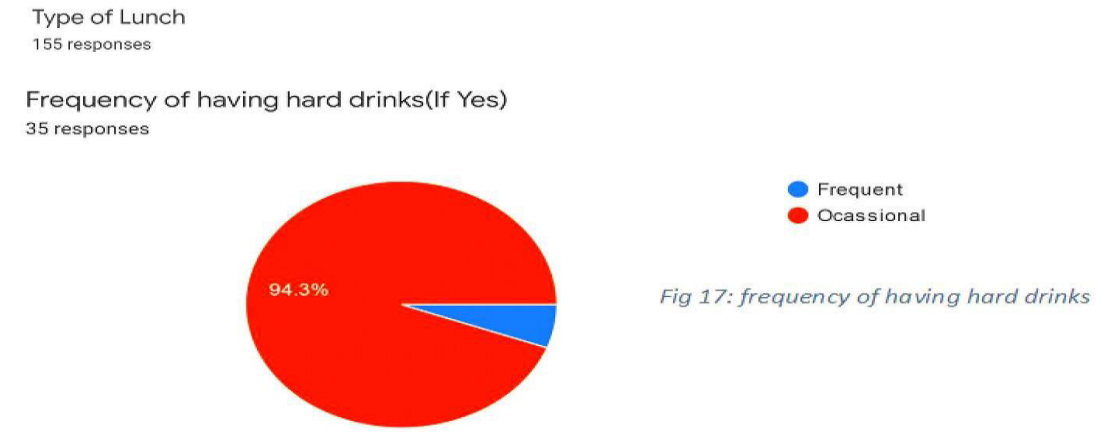

Fig 17: frequency of having hard drinks

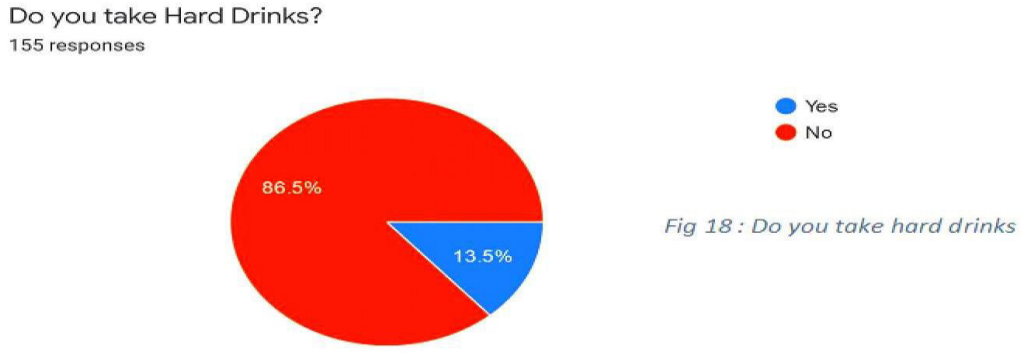

Fig 18 : Do you take hard drinks

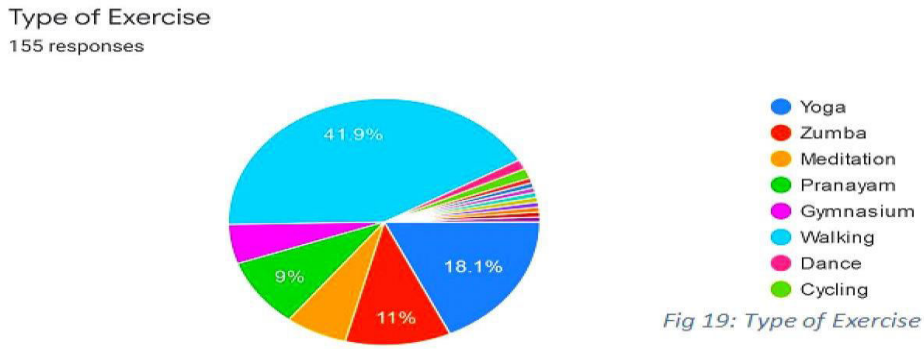

Fig 19: Type of Exercise

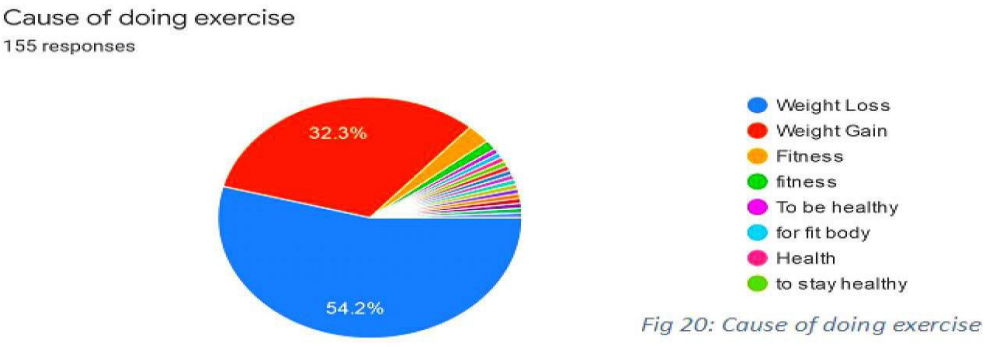

Fig 20: Cause of doing exercise

Above pie charts give information about daily habits of people responded. Above pie charts give detailed information about daily habits of people.

- Starting with Fig 5: Meal type shows type of meal taken by people i.e veg or non-veg. It shows that 51.6% people prefer non-vegetarian food and 48.4% people eat veg.
- In next figure i.e. Fig 6, we study the type of food consumed by people eating non-veg like Chicken, Meat, Egg, Fish. It shows that 52.9% people eat Chicken.
- For vegetarian people we studied frequency of sweet consumption i.e high, medium and low in Fig 7. It shows that 13.6% people have high consumptionof sweet, 62.1% prefer medium and 24.2% prefer low sweet consumption.
- Fig 8. Type of Meal shows 74.8% people eat fresh food, 12.4% people eat Ready to Eat food.
- Fig 9. Timings of exercise shows time in day people choose for exercise. Survey shows that 62.6% people exercise in morning, 12.3% at night, 22.6% in evening and 2.5% people in afternoon.
- Fig 10. Tentative time to sleep shows sleeping habits of people. It shows 61.3% people choose to sleep late night while 38.7% people sleep early night.
- Fig 11 studies type of sleep taken by people i.e heavy and light sleep. Survey shows 59.4%people take heavy sleep while 40.6% people take light sleep.
- In next figure i.e. Fig 12 we have studied the type of tension or pressure affects people. Results shows people are affected by different tensions like Frequent Headache, Frequent Giddiness, Anxiety, Fear, Sudden Criying, Depression, Pushing themselves to work and Migraine.
- Next Fig 13 shows type of lunch taken by people. It shows 67.3% people eat heavy lunch and 32.3% people eat light lunch.
- Fig 14. Type of Dinner shows that 63.2% people have light dinner and 36.8% people have heavy dinner.
- Study on water Intake of people in Fig 15 shows that 34.7% people drink water frequently, 29.3% people drink water less in quantity.
- Fig 16 shows that 52.9% people do not take soft drinks while 47.1% people like to have soft drinks.
- 86.5% people do not take hard drinks while 13.5% people drink hard drinks. Fig 18 shows these results.
- After studying frequency of having hard drinks of people who take hard drinks in Fig 18,in Fig 17 we get to know that 94.3% people have hard drinks occasionally.
- Fig 19 shows type of exercise done by people which includes Yoga, Zumba, Meditation, Pranayama, Gynnasium, Walking, Dance.

- We get to know the causes of doing exercise in Fig 20 which are Weight Loss, Weight Gain, Fitness, To be healthy.

7. CONCLUSION

Adolescence is the most important period of human life. It is the transition period from childhood to adulthood. During this period several changes takes place in the body of adolescent girls. Health and Nutritional status of an individual throughout adolescence is defined mostly by growth assessment.There is a significant negative relationship between unhealthier eating perceptions and low-sugar food intake, but no significant differences can be found among eating perceptions and the intake of low-sugar/fat food.Companies and institutions in the food industry can help adolescents to understand how their eating habits and practices can influence their overweight or underweight problems.Adolescent consumers with unhealthier eating perceptions show more overweight or underweight problems.Sports activities and good rest and sleep practices are more frequent among young consumersYoung people with overweight or thinness problems present an unhealthier lifestyle.The age of the sample can justify these results because, in that age range, unhealthy activities are less common (tobacco, drugs and alcohol consumption).

The present paper attempts to expand the scientific knowledge related to adolescents' lifestyles and perceptions and their possible effects on their lifestyle and their consumption of certain foods. Although this study has some limitations (e.g. adolescent consumers aged between 15 and 30 years and are only girl students), these findings contribute to a better understanding of how healthy lifestyles and eating perceptions may be related to the intake of some foods.In the current study, healthy eating was described as consuming three moderately balanced meals daily that consisted of sufficient fruits as well as vegetables, and avoiding fast foods, chips, candies, and desserts. This description was suggested from a previous study (Wu et al., 2009).

In order to assess the explanatory power of Theory of Planned Behavior model and its elements, we carried out a multiple regression analysis with behavioral intention as the dependent variable and the attitudes towards healthy eating, perceived behavioral control and subjective norms as independent variables. The regression was conducted in two steps. In the first step demographic variables were introduced , followed by the three predictors, attitudes, subjective norms, and perceived behavioral control. The obtained result comparatively from the predictive algorithms such as naive Bayes, Decision tree, support vector machine, and Recurrent neural network. Where Recurrent neural network provides us with the highest rate of accuracy is 97.62% since they follow the feed-forward loop.

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