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Assessment of Food Habits & Nutritional Status of Jharna Adults, Jaipur, Rajasthan

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Abstract

The growth and prosperity of a nation depend heavily on the nutritional status of its population. In India people have different food habits and their food is all together different too so it is interesting scientifically to study the nutritional profile of population. In this context a study was conducted in Jharna of Jaipur District of Rajasthan. A structured questionnaire was used to collect general information like weight, height, age, sex, educational level, occupation, food habits, nutritional intake, intake of salt & sugar, intake of fruits and vegetables, type of oil used and fast-food consumption. The study revealed that salt intake was high 60% population taking additional salt whereas only 17% population was taking high sugar amount. Further 47% population was consuming green leafy vegetables daily but 50% of the population was not consuming fruits at all. 60% population was using ground nut oil as the major cooking medium and one reason for this is the higher production of ground nut in the region. It was found further that 87% population was taking tea in the early and nothing else. Only a small population was having the diseases like blood pressure (7%), asthma (7%), heart problem (3%) whereas 77% of the population was not having any chronic disease and a reason to this is the work profile of the population majority was involved in the work having lot of physical activities. 73% of the population was not aware with the fast food. Only 26% population was overweight and 4% were heavily overweight.

Keywords: Nutritional status, Overweight, green leafy vegetables, Blood pressure, Physical activity.

Introduction

Nutrition is a basic human need and a prerequisite for a healthy life. A proper diet is essential from the early stages of life for proper growth, development and to remain active (NIN, 2010). It constitutes the foundation for human development, by reducing susceptibility to infections, reducing related morbidity, disability and mortality enhancing cumulative lifelong learning capacities and adult productivity. The growth and prosperity of a nation depend heavily on the nutritional status of its population. India is passing through the phase of economic transition, family structure and while the problem of under nutrition continues to be a major problem, prevalence of over nutrition is emerging as another significant problem, especially in the urban areas. The prevalence of overweight/ obesity was higher among the women (10.9%) compared to men (7.8%) in rural areas (NNMB, 2006).Widespread malnutrition and increased percentage of obesity is largely a result of dietary inadequacy and unhealthy lifestyle.

Diets of Indian rural areas are inadequate both in terms of quality and quantity. They mainly consume cereal based food but grossly deficient in legumes, animal foods fruits and green leafy vegetables (Gupta & Sen, 2001). Nutrition assessment has been defined by American Society of Parenteral and Enternal Nutrition (A.S.P.E.N) as "a comprehensive approach to diagnosing nutrition problems that uses a combination of the following: medical, nutrition, and medication histories; physical examination; anthropometric measurements; and laboratory data (A.S.P.E.N., 2010).

Materials and methods

A total of 100 adults, aged 18 - 50 years were selected for this study. Selection of subjects was random. The selected village was Jharna, Jaipur, Rajasthan in India. A structured questionnaire was used to collect general information like age, sex, educational level, occupation etc. Each questionnaire was interviewed personally asking for detailed information in order to collect even small information

regarding food habits & nutritional intake. Before filling the questionnaire, counseling was given in order to get correct, valid and reliable information about their diet, food habits & nutritional intake.

Efforts were also made to exclude closely related individuals to avoid the repetition of data. Therefore, the samples were free from any selection bias. Subjects were apparently healthy, between the ages of 18 years and above and were not severely ill during last three month

For the assessment of body mass index, height and weight measurements were taken. Body mass index (BMI) is calculated as the weight in kilograms divided by the square of the height in meters (kg/m2).

Habitual food intake was assessed using food frequency questionnaire (FFQs). The 24-hour recall method for seven days was used. FFQs give an indication of the habitual intake of particular foods or nutrients over a specific period of time. Information was collected on the frequency and, sometimes, portion size of foods eaten. Nutrient intake estimates can be derived (Thompson and Subur, 2008) from this. The average daily intakes of different foods by individuals were calculated according to different age/sex, physiological status and physical activity groups. The NNMB nutrient composition of the foods consumed by the individuals was calculated using 'Nutritive value of Indian Foods' (Gopalan et al., 1994). FFQs should be designed and validated for the specific purpose they are intended (Cade et al., 2004). Careful consideration must be given to the suitability of pre-existing questionnaires before they are used or adapted for other surveys (Cade et al., 2001).

Results and discussion

Fig. 1 depicts that female participants were found more (58%) as compared to male participants (42%) among subjects. The reason behind this could be that male members of selected area were out of the home because of occupation.
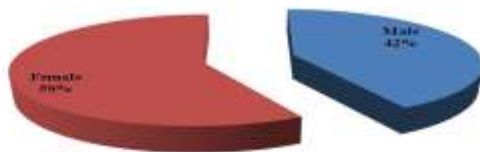

Fig. 1: Gender division of subjects

The majority of the subjects (48%) had no formal education, 36% were under graduate, 13% completed their graduation and only 3% subjects were such who completed their post graduation (Fig. 2)
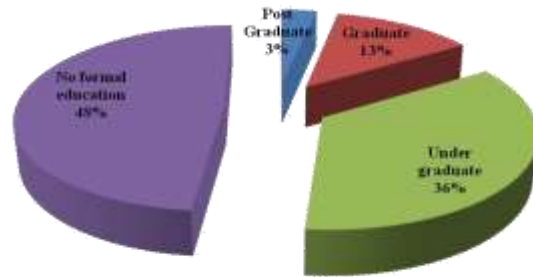

Fig. 2: Education level of subjects

Among female subjects, 56 % had no formal education, 22% attended school up to matriculation, 11% were matriculated, 5% completed their intermediate and 6% were graduated (Fig. 3).
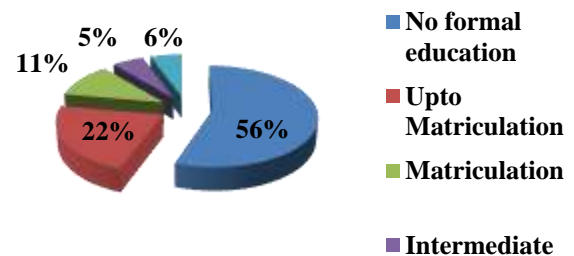

Fig. 3: Education level of Female subjects

The percentage of subjects who had no formal education was the most, followed by the subjects who went to school up to matriculation. The least percentage was of those subjects who were graduate. There was no one who had completed her post graduation .
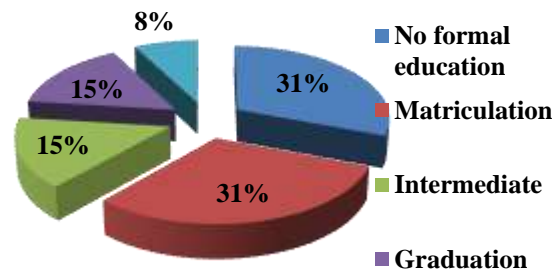

Fig. 4: Education level of Male subjects

In male subjects, 31% had no formal education, same number of subjects (31%) attended school up to matriculation, 15% were intermediate and 15% were graduate. The percentage of post graduate was 8. The percentage of those subjects who had no formal education was less in male subjects as compared to females. Other education levels were also high in male subjects vis-à-vis females (Fig. 4).

More than half of the female subjects (67%) were housewives, 28% were involved in house hold along with agriculture work. Only 5% were employed and they were also taking care of their families (Fig. 5). A study in a rural Malay community in Raub also reported a high proportion of the women (72%) as housewives (Norimah et al., 1999). The improvement in education leads to better opportunities for employment. Because, more than half of the female subjects had no formal education so they were not formally employed but they were helping their family in income generation through performing agriculture work.
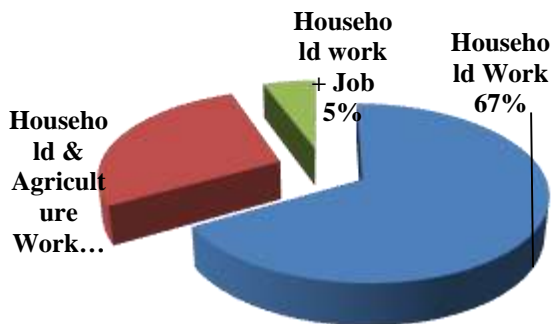

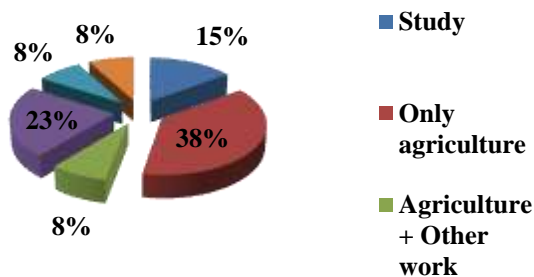*Fig. 5: Occupation of Female Subjects*

Fig. 6: Occupation (%) of Male Subjects

The data shown in fig. 5 shows that 67% female were involved in household work only while 28% were performing agricultural and household both work. Only 5% were engaged in formal occupation and household work.

Among males, 15% were students. The male population, engaged in agricultural work, was 38%.

8% were people who were occupied in agricultural in addition to other work. The percentage of males who were engaged in small business was 8% and similar percentage was involved in job (Fig. 6).
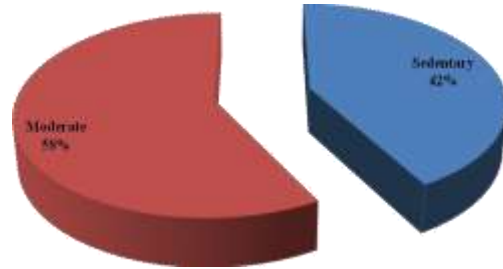

Fig. 7: Physical activity levels of subjects

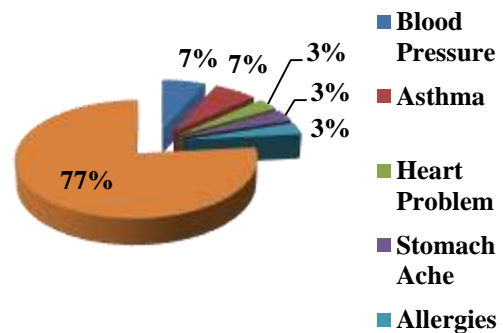Fig. 7 shows that 42% were involved in sedentary activity while 58% in moderate.

Fig. 8: Family history of diseases

Data shown in figure 8 depicts that blood pressure and asthma were the most prevalent diseases (7%) that were found in their family history. Stomachache, asthma and allergies were also found (3%) in their family history. The prevalence of asthma was more (13.34%) in rural adults (Gaur et al., 2006). Epidemiological studies show that a family history is a strong and independent risk factor for cardiovascular diseases (Nasir et al., 2004; Murabito et al., 2005), type 2 diabetes (Valdez et al., 2007), and many cancers (Pharoah et al., 1997; Isaacs, et al., 1995; Matakidou et al., 2005; Ziogas & Anton-Culver, 2003). This information could not only be used to identify individuals at increased disease risk but also to raise risk awareness and motivate people to engage in risk-reducing behaviors.

Remaining respondents were not having any family history of any diseases (Fig. 8)

Numerous studies have shown that a family history of CVD is an independent risk factor for developing CVD (Friedlander et al., 1985; Hoseini et al., 2008; Leander et al., 2001; Lloyd-Jones et al., 2004; Nora

et a., 1980; Scheuner et al., 1997, 2006). Compared to persons with no family history, those with a family history of CVD are 1.5 to 9.0 times more likely to develop CVD, depending on the relation, number and age of onset of the relative(s) (Mc Cusker et al., 2004).

Fig. 9: Intake of salt

60% of respondents were found to consume extra salt in their diet (Fig. 9) which is not a good dietary habit. Though sodium is a vital nutrient but excess of this can make susceptible to high blood pressure and other diseases.

In healthy individuals, nearly 100% of ingested sodium is absorbed during digestion, and urinary excretion is the primary mechanism for maintaining sodium balance but increased sodium consumption is associated with increased blood pressure, whereas lower sodium consumption appears to decrease blood pressure in adults (Holbrook et al., 1984; Cutler et al., 1997; He and MacGregor, 2003, 2004). Increased sodium has also been associated with cardiovascular diseases (WHO, 2007; Strazzullo et al., 2009).
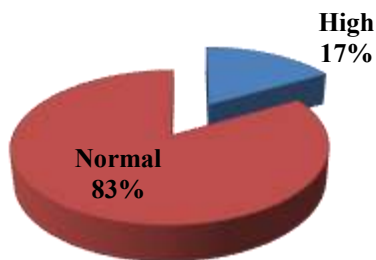

Fig. 10: Intake of sugar

Sugar intake was found higher in 17% people. While 83% were not consuming extra sugar.
Extreme intake of sucrose may be associated in normal adults with elevations in plasma glucose and cholesterol, all of which may be undesirable (Fig. 10).
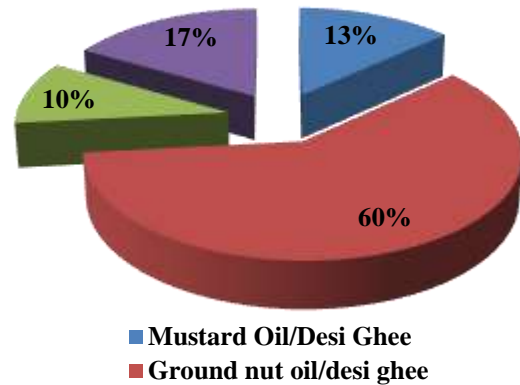

Fig. 11: Status of cooking medium

Majority of the subjects (60%) consume ground nut oil or desi ghee as cooking medium. 17% use only ground nut oil while mustard oil or desi ghee consumers are 13%. 10 % subjects use only desi ghee as their cooking medium. Vegetable oils in particular are natural products of plant origin consisting of ester mixtures derived from glycerol with chains of fatty acid contain about 14 to 20 carbon atoms with different degrees of unsaturation (Emmanuel and Mudiakeoghene, 2008). Groundnut oil is widely used in south India for cooking. Groundnut oil contains 46 and 32 percent of monounsaturated fatty acids (MUFA) and polyunsaturated fatty acids (PUFA), respectively (USDA, 1997). Rasmussen et al. (1993) noted a reduction in peak plasma glucose concentration with the consumption of a monounsaturated fatty acid-rich diet. People consuming nuts once a week with those whose consumption is 1-4 times/wk, and showed a 25% reduction on the risk of dying from CHD in the last group. The consumers eating nuts more than 5 times/wk experienced a ~50% reduction in risk (Dreher et al., 1997). Dietary fat plays an important role in cardiovascular health. Numerous studies have been carried out to identify the type of fat that correlates with the CVD. Excessive intake of saturated fat raises total and LDL cholesterol levels (Keys, 1980). It also has a negative effect on blood pressure and arrhythmias. Mustard oil is good for heart and also has many other benefits. Mustard oil contains a high amount of selenium and magnesium, which gives it anti-inflammatory properties. It also helps stimulating sweat glands and helps lowering body temperature. In traditional medicines, it is used to relieve the pain associated with arthritis, muscle sprains and strains (Sood et al., 2010).
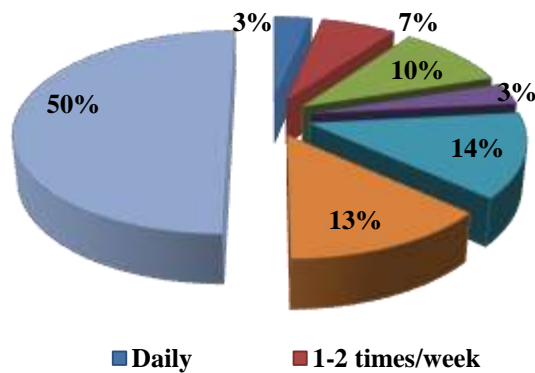
Fig. 12: Consumption of fruits

The subjects who were consuming fruits on daily basis was 3%. Whereas 7% were consuming 1-2 times in a week. Occasionally consumers of fruits were 13% while 10% were consuming 2-3 times/week, 14% were consuming 4-5 times/week whereas 50% subjects were not consuming fruits at all.
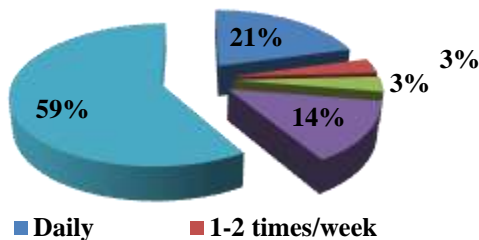

Fig. 13: Consumption of Salad

47% subjects were consuming salad daily whereas 13% were consuming salad occasionally 3% subjects were found consuming salad 4-5 times/week. 17% subjects were consuming salad 2-3 times/week however 10% subjects were found consuming salad only 1-2times/week and 10% reported that they do not consume the salad at all.
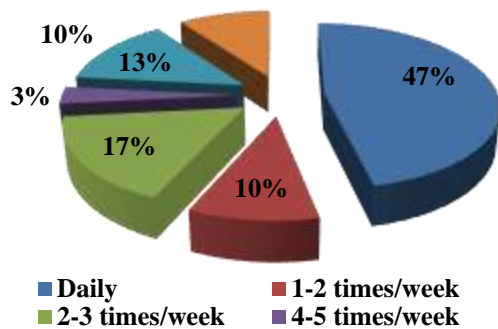

Fig. 14: Consumption of green leafy vegetables

Insufficient consumption of fruit and vegetables was among the risk factors recognized as contributing to the world wide non communicable disease burden (WHO, 2002). Eating at least five servings per day of fruits and vegetables is recommended to reduce risks for cardiovascular disease and cancer (Heimendinger et al., 1996; Heimendinger & Chapelsky , 1996; Krauss et al., 2000). Consumption of sufficient amounts of fruit and vegetables are recommended as part of a healthy diet. Fruit and vegetables may reduce chronic diseases and more specifically, coronary heart disease (CHD) (Pereira et al., 2004), by means of their protective constituents such as potassium, folate, vitamins, fiber, and other phenolic compounds (Van Duyn & Pivonka, 2000). These nutrients act through a variety of mechanisms, such as reducing antioxidant stress, improving lipoprotein profile, lowering blood pressure, increasing insulin sensitivity, and improving hemostasis regulation (Van Duyn & Pivonka, 2000; Appel et al., 1997; Bazzano et al., 2003).

A diet that is higher in vegetables and fruits can significantly increase the antioxidant capacity of serum and protect against in vivo lipid peroxidation (Miller et al., 1998). In a subsequent report, the investigators found significant inverse associations between flavonoid intake and major food sources of flavonoid, including apple, berries, and onion, and death from coronary heart disease (Knekt et al., 1996). Fruit and vegetable consumption was inversely related to incident type 2 diabetes (Colditz et al., 1992; Feskens et al., 1995; Ford & Mokdad, 2001; Snowdon & Phillips, 1985). The biological mechanisms responsible for the beneficial effects of fruits and vegetables on diabetes risk are likely to be multiple. Besides their contribution to low energy intake, high fiber content, and low glycemic load, fruits and vegetables are also rich in antioxidant vitamins, magnesium, potassium, plant proteins, and other individual phytochemicals, which could be beneficial in reducing risk of type 2 diabetes (Bazzano   et   al.,   2003).
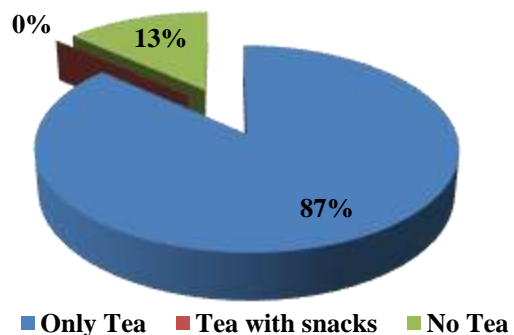

Fig. 15: Intake of early morning meal

Fig. 15 illustrates that 87% subjects who were consuming tea were not taking any snakes with the tea and remaining 13% subjects were not consuming tea at all.
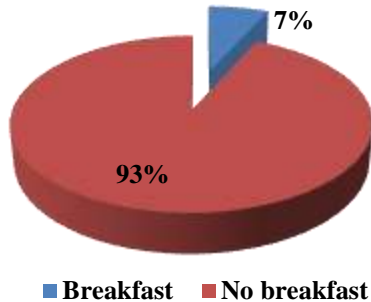

Fig. 16: Intake of breakfast

Fig. 16 depicts that 93 % subjects were skipping breakfast while only 7% were consuming the same. Breakfast is known as the most important meal of the day, it provides people with fuel to begin their day. As a person sleeps the body changes from the fed to the fasted state which causes the serum glucagon concentrations to elevate. As a result the liver produces glucose by converting glycogen to glucose. This occurs until one fourth of the glycogen stores are depleted. When food is consumed fuel homeostasis is maintained (Hill, 1995).

The majority of breakfast studies have observed that breakfast skippers are more likely to be overweight (Hill, 1995; Rampersaud et al., 2005). This is caused by an increase in snacking and a higher intake of high fat foods throughout the day.

Skipping breakfast may worsen early morning operations, leading to lower rates of intellectual performance and endurance in the case of physical exercise (Cueto, 2001; Vermore et al., 2003; Fanjiang & Kleinman, 2007)

Performance is comparatively more efficient not only immediately after consuming breakfast, but also throughout the following hours, as also observed in adult subjects (Rampersaud et al., 2005; Bellisle, 2004; Smith, 1999). Breakfast may modulate brain function by at least two biological mechanisms: a) by providing the central nervous system with essential nutrients and b) by modulating the efficiency of cognitive processes (Pollitt & Mathews, 1998). Indeed, regular breakfast consumption is associated with improved insulin sensitivity and higher glucose tolerance during the following meals; reduced circulating LDL cholesterol levels and LDL oxidation; and lower blood triglycerol concentrations (Farshchi et al., 2005).
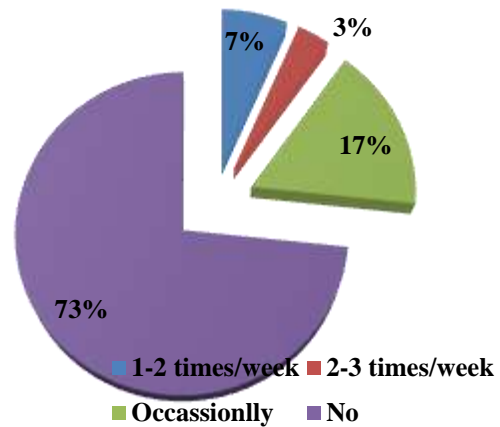

Fig. 17: Intake of fast food

Fig. 17 illustrates that 73% subjects were not consuming fast food at all. 17% were consuming occasionally. The subjects who were consuming the same 1-2 times in a week were 7%. 3% were consuming fast food 2-3 times in a week. Studies revealed an association between increases in soft drink consumption and higher rates of overweight and obesity (Basu et al., 2013).

Fig 18. illustrates that 70% of subjects were found to have healthy weight. The percentage of overweight subjects was 26% and remaining 4% were severely underweight. Most of the co-morbidities relating obesity to coronary artery disease increase as BMI increases, they also relate to body fat distribution.
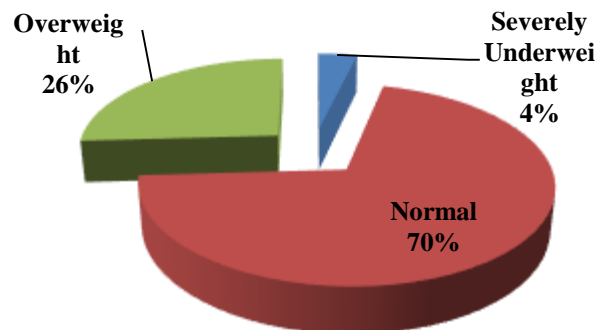

Fig. 18: BMI status

Long-term longitudinal studies, however, indicate that obesity as such not only relates to but independently predicts coronary atherosclerosis (Manson et al., 1995; Garrison & Castelli, 1985; Rabkin et al., 1977). This relation appears to exist for both men and women with minimal increases in BMI. Hypertension is approximately three times more

common in obese than normal-weight persons (Van Itallie, 1985). This relationship may be cause-and-effect in that when weight increases, so does blood pressure, (Kannel et al., 1967) whereas when weight decreases, blood pressure falls (Reisin et al., 1983).

Conclusion

The study revealed that marginal population (7%) was found mainly affected by blood pressure and asthma whereas 77% population were not having any major or chronic diseases. Intake of salt was found very high. 60% of the population consumed additional salt and that might be one of the reasons of high blood pressure in 7% population. Further majority of the population (60%) was consuming groundnut oil or desi ghee as a cooking medium. Only 3% of the population was consuming fruits on daily basis. Lack of awareness about the benefits of fruits consumption among the population could be the reason, which is alarming. However 47% population was aware about the benefits of consuming salads. 83% of the population was taking only tea in the morning and 93% population was not having any breakfast. Only 27% population was consuming fast food. 22% population was overweight whereas 70% population was having healthy weight.

Acknowledgements

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