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Awareness, Knowledge and Attitude towards Green Leafy Vegetables among Urban Women

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ABSTRACT Leafy greens are an important part of any diet. They provide fiber, essential vitamins and minerals like iron, calcium and magnesium and add to any meal. They provide protection against diseases like high cholesterol, heart disease, and diabetes etc. Indian cuisine is noted for its use of leafy greens that are commonly called as *"Saag"*. *Saag* is a generic term used for a variety of greens like spinach, mustard leaves, *amaranth* etc. The present study aimed to assess women's knowledge and consumption pattern of Green Leafy Vegetables (GLVs) and factors influencing the buying behavior. The present study was carried out on 100 women of Raipur City. A self-designed interview schedule including information on demographic data and knowledge about GLVs has been used to collect the data. 82% women said that they consume Green Leafy Vegetables and 27% of women consume GLVs because they are cost effective, 25% of women consume GLVs due to perceived nutritional value.

INTRODUCTION

Leaf vegetables, also called potherbs, greens, vegetable greens, leafy greens or salad greens, are plant leaves eaten as a vegetable, sometimes accompanied by tender petioles and shoots. Although they come from a very wide variety of plants, most share a great deal with other leaf vegetables in nutrition and cooking methods (Kennedy 2014). On average, the leafy vegetables contained 33.3 g/100 g DM crude protein (range 31.7–34.6 g/ 100 g) and 8.4 g/100 g DM (range, 7.4–9.8 g/100 g DM crude fibre. Gross energy averaged 378 k cal/100 g. The protein extracts contained, on average, 47.2 g/100 g DM crude protein (range 35.1–54.9 g/100 g) 1.4 g/100 g DM crude fibre, 7.9 g/100 g DM ether extract; 15.7 g/100 g DM ash and a gross energy of 439 kcal/100 g. Ca, Mg, Na and K were the most abundant minerals in the leaf meals and leaf protein concentrates while P and Cu were the least abundant (Aletor et al. 2001). Nearly one thousand species of plants with edible leaves are known leaf vegetables, most often come from short-lived herbaceous plants such as lettuce and spinach (Kessler and Glauser 2014).

Ali et al. (2010) reported that red-fleshed leaf cultivars of amaranth contained higher amount of pigments, total polyphenol and antioxidant activity than green-fleshed leaf cultivar. Significantly high value of dry matter (%) was recorded in Swiss chard (22.9%) followed by chenopod local (16.5%)

Leaf vegetables contain many typical plant nutrients, but since they are photosynthetic tissues, their vitamin K levels in relation to those of other fruits and vegetables, as well as other types of foods, are particularly notable (Chang et al. 2014).Green leafy vegetables are used since ancient periods as source of food as they contain many nutrients and minerals which are helpful in maintaining human health. The health and nutrition of expanding world populations are major upcoming challenges especially in developing countries. Plant foods are sources of energy, micronutrients and nutrients essential to health, in addition to phyto-chemicals with further health benefits including glycemic control, immuno-stimulation or antioxidant activity (Bélanger 2004).

The Expert Committee of the Indian Council of Medical Research (ICMR), taking into consideration the nutrient requirements, has recommended that every individual should consume at GLV: 50 g (NIN 2011).

MATERIAL AND METHODS

Selection of Area

Raipur is capital of Chhattisgarh. It was formerly a part of Madhya Pradesh before the state of Chhattisgarh was formed on 1 November

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2000. Traditionally, Raipur's economy has been based on agricultural-processing and saw-milling. The city is located centrally in the state of Chhattisgarh, and now serves as a regional hub for trade and commerce for a variety of local agricultural and forest products. The current study was a pilot study which was conducted on women of different age group in Raipur city.

Selection of Sample

This study was conducted on 100 women between ages group of 15 to above 45 years. All the samples were selected randomly from the various areas of Raipur city. Raipur city was categorized in 5 zones: East, West, North, South and Central zone. Care was taken while selecting samples. It was ensured that samples should be selected in equal number from each zone.

Data Collection

The study was conducted between July and August 2013. The samples were heterogeneous groups from different occupations and economic status. For demographic and social profile, scale developed by Kuppuswamy has been used. The criteria for selecting samples for participating were willing to share their own experiences. Based on the preliminary discussion with the women, a structured interview schedule was developed. Participants provided written consent before starting interview. If participants agreed to take part in research; a schedule was distributed to them. The pretested interview schedule has 50 questions comprising open and closed ended questions and it was administered to assess their knowledge levels regarding GLVs. The 50 open and closed ended questions covered main themes viz., 1) demographic details, 2) knowledge about Green Leafy Vegetables, 3) Attitude towards consumption of GLVs.

Statistical Analysis

All the results were statistically analyzed by using percentage, Frequency and cumulative frequency.

RESULTS

The results are discussed under three heads namely 1) demographic details, 2) knowledge about GLVs, 3) attitude towards consumption of GLVs.

Demographic Profile

Table 1 indicates the profile of women in Raipur city. All the 100 women were divided into three main age brackets: (1) 50 % of the women were in 15 years to 25 years age bracket, (2) 44% of the women were in the 26 years to 45 years age group, and (3) 6% of the women were in the age group of above 60 years. As per literacy level 26% of women were postgraduate and above and 58% of women graduate whereas remaining 16% women had studied up to higher secondary education only (Table 2).

Table 1: Age wise distribution of sample

S. No.	*Age group*	*Numbers*	*%*
1	15-25	50	50
2	26-45	44	44
3	Above 45 years	6	6

Table 2: Education level of participants

S. No.	*Row Labels*	*Count*
1	Graduate	58
2	Higher Secondary	12
3	Post Graduate	26
4	Secondary/Intermediate	4

It is evident from the data that these women belonged to nuclear and joint families and most of (76%) they were married. Among the studied women, 58% belonged to the joint families and 42% of the women were from nuclear families (Table 3).

Table 3: Family distribution of sample

S. No.	*Type of family*	*Count*
1	Joint family	42
2	Nuclear family	58

Income levels have been decided using the Kuppuswamy scale and as per the Table 4, 48% of the women have income level more than Rs.

Table 4: Income distribution of sample

S. No.	*Income Level*	*Number of participants*
1	less than 12000	8
2	12001-16000	16
3	16001-32000	28
4	More than 32000	48

32,000, followed by 16% of women in income group of Rs. 12000 -16000, and 28% in the bracket of Rs 16000-32000. 8% of the women were having income level of Rs. 8000-12000.

Knowledge about GLVs

From the vast list of available GLVs nearly most majorly grown and available, 14 GLVs were selected for the study and the women have been asked to provide their response against predefined questionnaire. It is concluded that the *Palak (Spinancia oleravea)* and *Methi (trigonella foenum graecum)* has the highest awareness among with 100% and 98% which is followed by *Dhaniya (Coriander Satimum) , Mithi Neem (Murraya Koenigii)* and *Pudina(Mentha Spicata).* It is also notice that very few people have awareness about *Kusum (Carthamus Tinctorius)* (6%), *Chana (Cicer Arietinum)*(12%) and *Pyaj (Allium Cepa)* (14%). Consumption of difference available green leafy vegetables were studied and it has been observed that in a week 28% of women eat GLVs at least three times whereas 22% of women eat GLV once in a week, 24% of the women eat GLV twice in the week, whereas 8% of women have respondent they eat GLV 4 times in a week and 18% of women have said that they don't eat GLV (Table 5).

Table 5: Consumption of green leafy vegetables

S. No.	*Parameters*	*Women N=100 %*
1	Don't eat GLV	18
2	Eat GLV at least once in a week	22
3	Eat GLV at least twice in a week	24
4	Eat GLV at least thrice in a week	28
5	Eat GLV at least four times in a week	8

It has been observed that the women normally consume most of the GLVs during the dinner as 60% of women reported this, and further 40% of the respondents says they would prefer to consume GLVs during the breakfast, 26 % of the women says they take GLV during the lunch and 10% of GLV consuming women have said in the evening they will eat GLVs.

Attitude towards Consumption of GLVs

Frequently Consumed GLV

During the study it has been reported that the women have fair good knowledge of GLVs under the study but the consumption pattern is mainly limited to *palak* and *methi.* The main reason of this behavior has been reported as the availability of these green leafy vegetables (Table 6).

Table 6: Buying behavior of GLVs

Reasons	*Consumption factor*	*Cumulative*
Culture	11	11
Easily available	12	23
Perceived nutritional value	14	37
Recommended by physician	4	41
Cost effective	15	56

Cost effectiveness (27%), perceived nutritional value (25%) and easily availability (21%) of GLVs have been reported as the major factor for consumption, whereas only 7% of women have reported the consumption due to medical recommendation (Table 7).

Table 7: Reasons of consumption of GLVs

S. No.	*Reasons*	*Count of respondent*
1	Cultural	20
2	Easily Available	21
3	Perceived Nutritious	25
4	Medically Recommended	7
5	Cost Effective	27

DISCUSSION

Dietary zinc, copper and iron intakes shows that lower calorie intakes of women were responsible for their low mineral intakes. Intra-individual variation in mineral intakes was higher (18.39%) than that of energy intakes (14-17%) in both men and women. Phytate: Zn molar ratios were > 15 indicating risk of zinc deficiency in these students (Chiplonkar et al. 1993). Satheannoppakao et al. (2009) have found that The amounts of fruit and vegetables consumed by Thai participants were far below the level of current recommendations. Public education and campaigns on adequate consumption of fruits and vegetables should be targeted more towards low socio-economic groups. Study by Singh et al. (2001) , have reported that spinach, amaranth, bengal gram, cauliflower, mint, coriander and carrots - Moisture content of the leaves and car-

rots varied from 75.1 percent (bengal gram) to 95.4 percent (carrot) and protein from 9.83 percent (carrots) to 30.9 (mint) percent. Ascorbic acid, β-carotene, total iron and ionizable iron contents were at a maximum in case of Bengal gram leaves whereas level of ionizable iron and in vitro iron as a percent of total iron was highest in carrots. Copper, manganese and zinc contents were maximum in spinach. Nair and Iyengar (2009)found that the intake of green leafy vegetables, which are major sources of folate, and animal products, which are main source of vitamin B12, are meagre in India. Arlappa et al. (2010) have reported that the intakes of leafy and non-leafy vegetables were less than Recommended Dietary Intakes in 88 and 67% of households respectively, while the corresponding figure for pulses was 73%. Dietary pattern and nutrition related knowledge of rural adolescent girls Choudhary et al. (2010) have concluded that Access of nutrition related knowledge was poor for adolescent girls. Their nutrition related knowledge was not up to the mark and majority of them were not aware about their nutritional needs. Ignorance about micronutrients and protective foods prevailed in adolescent girls. During the production season, *amaranth* leaves provide some African societies with as much as 25 percent of their daily protein. At first sight, this scorn seems almost universal. *Amaranthus* is one of the few genera whose species were domesticated in both the Old and New World. It has provided very ancient potherbs (boiled greens) not only to Africa but to Asia and the Americas as well (National Research Council 2006). *Amaranth* seeds can be used in food, because it is a good source of ANT and TP with high antioxidant activity (Posko et al. 2009).

CONCLUSION

Current study was aimed to explore the factors responsible for the Knowledge towards Green Leafy Vegetables among women from Raipur city. It was concluded that the women were distributed over age 15 to above 45 years. About 84% of women were having their qualifications as graduates and above. 48% women were having their monthly income more than Rs.32, 000. 48% women belonged to nuclear families. 82% women said that they consumed Green Leafy Vegetables and 27% of women consumed GLVs since they were cost effective, 25% of women consumed the GLVs due to perceived nutritional value. But due to changing life style and for saving time women consumed other foods which are ready to cook. This results shows that women have knowledge of Green Leafy Vegetables because of their educational status. Women collected the information from TV, newspaper, magazines, and internet.

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