

## Micronutrient Adequacy of Breakfast of Saudi Arabian Female Adolescents and Early Adults

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### **Abstract:**

**Background** -The Western diet is slowly replacing the traditional Arabic diet. Due to this reason there is a significant increase in the number of overweight and obese adolescents. Faulty eating habits and lifestyle are related to the development of obesity.

**Aim** -This study tested the hypothesis whether skipping breakfast especially in terms of micronutrient intake are related to the increase in overweight and obesity among Saudi Arabian adolescents.

**Methods**-In 2013, a cross-sectional study was conducted among 1000 female adolescents and early adults (19-24 years old) who were selected by random sampling from four randomly sampled colleges in the University of Hail KSA. The Body Mass index was assessed using anthropometric measurements. Dietary habits were evaluated by a 24 hour dietary recall and a food frequency questionnaire. Breakfast skipping habit was noted. The percentages of RDAs met by micronutrient intake during breakfast were calculated using ESHA software.

**Results:** The results of the study revealed that a majority of the subjects belonged to the normal weight category (35 %), followed by overweight (28 %), underweight (10 %) and obese (27 %) categories. All the micronutrient intakes during breakfast fell short of the RDAs by 20 to 35%. No significant differences existed in the micronutrient intake of breakfast between the obese and non obese groups. However, obesity was significantly related to skipping of breakfast.

**Practical implications:** In summary, increased weight status of Saudi adolescents and early adults was related to their improper dietary habits and deficient nutrient intakes. This indicates the importance of rapid promotion of healthy lifestyle and advising on the need for nutrient dense food choices during breakfast among Saudi Arabian adolescents both for underweight and obese subjects.

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### **I. Introduction**

The accessibility of a variety of food supplies and meal patterns is due to the high per capita income in Saudi Arabia (Madani et al., 2000 and Alshammari, 1994). Such dietary patterns have led to the increasing prevalence of health problems, the major reasons being overweight and obesity (WHO, 2005). Owing to the affluent life style increased morbidity and mortality prevail in Saudi Arabia (Duangtep et al., 2010).

A very low intake of micronutrients is due to food affluence and a lack of nutritional awareness (Al Assaf and Al Numair, 2007). Factors which contribute to obesity, are genetic, lack of physical activity, and intake of high fat and energy dense foods. (CDC, 2011).

Consolidating healthy eating habits and lifestyle behaviors is crucial during adolescence. (Williams et al., 1995). Weight loss can be achieved by therapeutic lifestyle changes which includes a reduction in energy intake and saturated fat intake and an increase in physical activity (Al-Shoshan, 1990), Al-Sheri, 1996, Al-Sudairy and Howard, 1992, Albassam et al., 2007). A low intake of vegetables and fruits together with irregular meals were the common unhealthy eating habits. Lifestyle modification is important, especially in adolescents to inculcate healthy habits earlier in life (Albassam et al., 2007).

### **II. Methodology**

For this cross sectional study, 1000 female adolescents 19 to 24 years were selected at random from four randomly sampled colleges (out of 10) of the University of Hail. The colleges were Colleges of Medicine, Applied Medical sciences, Nursing and Information technology. The information collected from the adolescents were age, socioeconomic status, height, weight, details of skipping breakfast and 24 hour dietary recall.

This information was fed into SPSS and ESHA softwares to identify the micronutrient intakes met by breakfast using T test.

### **III. Results**

The BMI category of the subjects is presented in Table 1.

**Table 1 BMI category of the selected subjects**

| BMI           | Percent |
|---------------|---------|
| Underweight   | 10.0    |
| Normal Weight | 35.0    |
| Overweight    | 28.0    |
| Obese         | 27.0    |

A majority of the selected subjects (35%) were normal weight, followed by 28% overweight and 27% obese subjects. Only 10% of the subjects were underweight. These imply faulty eating habits of the Saudi adolescents both in the underweight, overweight and obese categories. In a cross-sectional survey conducted among girls aged 13 to 18 in Jeddah, 24% were overweight or obese and 14% were underweight (Jaaly, et al., 2011). This finding is similar to the findings of the present study.

**Table II Percentage of RDA met by the micronutrient intake of breakfast**

| Percent of DRI met by Breakfast | Mean (%) | Std. Deviation |
|---------------------------------|----------|----------------|
| Thiamine                        | 21.0     | 10.48          |
| Riboflavin                      | 23.0     | 17.28          |
| Niacin                          | 25.0     |                |
| Pyridoxine                      | 30.0     | 13.48          |
| Vitamin B12                     | 25.0     | 7.24           |
| Folic acid                      | 20.0     | 10.82          |
| Vitamin C                       | 20.0     | 18.23          |
| Vitamin A                       | 22.0     | 22.32          |
| Vitamin D                       | 25.0     | 21.34          |
| Vitamin E                       | 35.0     | 17.21          |
| Vitamin K                       | 25.0     | 21.23          |
| Iron                            | 20.0     | 33.28          |
| Calcium                         | 22.0     | 28.12          |
| Phosphorus                      | 20.0     | 11.22          |

The micronutrient intakes fell short of the RDAs by 20 to 35%. Folic acid, vitamin C, iron and phosphorus fell short of the RDAs by 20%, followed by a majority of micronutrients which fell short of the RDAs between 20 and 25%. Vitamin E and pyridoxine fell short of the RDA from 30-35%. This could be due to the fact that the adolescents did not eat a balanced diet during breakfast or skipped their breakfast. Due to their study schedules, the adolescents had little time to concentrate on breakfast.

### Relationship to BMI

None of the micronutrient intakes were related to BMI. This may have been due to the fact that BMI is more related to macronutrients than to micronutrients. Higher intake of macronutrients and lower intake of micronutrients in the population are due to food affluence and high income combined with a lack of nutritional awareness and physical activity (Al Assaf and Al Numair, 2007).

Also skipping breakfast was significantly related to obesity.

## IV. Conclusion

Breakfast is the most important meal of the day and it is important to note that having a more adequate breakfast would help in the long run to prevent both obesity and overweight and prevent frequent high fat, high salt and high empty calorie snacking during the rest of the day. Also attributes such as learning ability, physical performance, productivity and reproductive outcome depend on adequate nutrient intakes especially during breakfast.

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