



## **Correlation between Oral Health Status (DMFT) and BMI Index in Khuzestan Province, Iran during 2012-2013**

***\*Feroogh KHALILINEJAD<sup>1</sup>, Mohammad Reza KHALILIAN<sup>2</sup>, Neda RASAEI<sup>3</sup>, Azadeh SAKI<sup>4</sup>***

1. *Dept. of Orthodony, School of Dentistry, Abvaz Jundishapur University of Medical Sciences, Abvaz, Iran*
2. *Dept. of Pediatric Cardiology, School of Medicine, Abvaz Jundishapur University of Medical Sciences, Abvaz, Iran*
3. *Dept. of Periodontology, School of Dentistry, Abvaz Jundishapur University of Medical Sciences, Abvaz, Iran*
4. *Dept. of Biostatistics, School of Health, Abvaz Jundishapur University of Medical Sciences, Abvaz, Iran*

**\*Corresponding Author:** Email: khalilinejad@hotmail.com

**(Received 04 Aug 2014; accepted 24 Aug 2014)**

### **Dear Editor- in-Chief**

Having a healthy long life cannot be achieved without a good cooperation between different parts of the body. Obesity is considered to be the fastest growing health risk in the world (1). Iran has experienced a rapid nutrition transition characterized by decrease in physical activity and increase energy intake leading to rapid overweight since 1990s (2). On the other hand, worldwide, dental caries is the most prevalent of the oral diseases. The decayed, missing and filled teeth (DMFT) index was created to express caries experience (3). In many countries, including Iran, most epidemiological research in dentistry has been conducted among children and adolescents, while the corresponding data on adults are limited.

According to the previous surveys Khuzestan was one of the province with the highest DMFT index in the country (4) makes it a strategic place for further researches so we conducted a study to determine BMI index, and oral health status (DMFT) according to sex, place of living, level of education, frequency of tooth brushing of people living in the southwest of Iran and also the relation between those indices with a goal to provide data that may be useful for health policy development and program planning. This cross-sectional

analytic epidemiologic research was a one-stage observation with multistage cluster sampling method consisted of 1500 subjects from a population of approximately 3070342, aged 5-6, 12, 15, 35-44 and 65-74 year olds living in rural and cities of Khuzestan, Iran during 2012 through 2013. The procedure started by randomly selecting 100 families as clusters and 300 samples for each age group using statistical software and postal addresses. One dentist with trained oral hygienists carried out the whole examination. All recruits received an explanation regarding the examination and had been invited to take part in the health Survey. Individuals with known systemic diseases that can affect the BMI or DMFT index such as diabetes or thyroid disorders were excluded from the study. Demographic information consist of sex (male versus female), location (city versus rural), frequency of tooth brushing (daily, weekly, often, never), level of education in adults (illiterate, primary, secondary, university) was collected from each participant. The clinical examination taken place with the use of portable dental unite, plane mouth mirrors and WHO ball ended periodontal probes. No radiograph had been taken. The decayed, missing and filled teeth (DMFT) index for

permanent dentition and DMFT for primary dentition was recorded using WHO standard criteria and had been written on the standard WHO dental assessment forms.

Anthropometric (height in meter and weight in kilogram) measurements were done for each participant using standard digital scales for calculating BMI. BMI values calculated from equation of weight (kg)/height (m)<sup>2</sup>. According to the growth chart from national center for health statistics (NCHS) / centers for disease control and prevention (CDC) 2000 BMI-for-age criteria calculated as group I (underweight < 5th percent), group II (normal weight =5th-85th percent), group III (at risk of being overweight > 85th and < 95th percent) and group IV(overweight > or = 95th percent).

Of 568 males and 932 females examined in this study the mean DMFT index for Khuzestanian population was found 2.41 without any significant

differences according to sex and location. Table 1 shows data on decayed/ missing/ filled teeth and compares the DMFT values of subjects with respect to their age, sex, location and BMI. One way ANOVA followed by a post hoc test showed Significant higher DMFT indices were found by increasing the age factor between all groups ( $P<0.05$ ) except between first and second groups  $P=0.28$ . In general linear model DMFT was found to be significantly and directly associated with frequency of tooth brushing. Multiple linear regression established that by increasing in BMI indices, DMFT showed significant higher scores in all groups except between groups with risk of overweight and overweight. Of 600 adults examined in two age groups (35-44 and 65-74 year old) people with higher educational level showed lower DMFT indices but it was not statistically significant except in illiteracy level ( $P<0.05$ ).

**Table 1:** Mean±SD of DT, MT, FT and DMFT indices according to age, sex, location, BMI

Variable		DT Mean±SD	MT Mean±SD	FT Mean±SD	DMFT Mean±SD
Age groups (yr)	5-6	0.00±0.00	0.00±0.00	0.00±0.00	0.00±0.00
	12	0.20±0.71	0.00±0.05	0.02±0.28	0.23±0.76
	15	0.72±1.41	0.11±0.89	0.14±0.62	0.98±1.84
	35-44	2.18±2.51	1.08±1.88	0.81±1.43	4.09±3.17
	65-74	1.85±2.43	4.57±4.51	0.20±1.04	6.63±4.81
Sex	Male	0.88±1.78	1.35±3.09	0.17±0.80	2.41±3.97
	Female	1.07±2.01	1.05±2.66	0.28±0.96	2.40±3.62
Location	City	0.96±1.83	1.06±2.59	0.31±0.99	2.34±3.54
	Rural	1.08±2.12	1.36±3.24	0.09±0.66	2.54±4.14
BMI	Underweight	0.20±0.81	0.14±1.21	0.01±0.15	0.36±1.54
	Normal Weight	1.03±1.93	1.21±3.06	0.18±0.78	2.43±3.85
	At risk of over- weight	1.72±2.27	1.87±3.06	0.57±1.40	4.16±4.06
	Overweight	1.61±2.50	2.14±3.32	0.43±1.11	4.20±4.01

Obesity and caries have so many common risk factors such as consumption of carbohydrate and taking midday snacks (5). However, several reports describe an inverse relationship between dental caries and weight (6, 7). Since the time interval between the latest survey in Khuzestan in

2004 (4) and current survey, higher DMFT rates and lower DMFT rates were obtained for 6-year-old children. In this study, we also examined adult and old population of Khuzestan for DMFT and BMI, which has not been reported by others based on our dates. Elderly population with oral

diseases and tooth loss has difficulties in chewing. This may in turn lead to selection of soft diets, which in most cases are composed of refined carbohydrates. This would easily predispose to malnutrition and general ill health. Also according to the results of this study, greatest DMFT scores were in illiterate group. The same results were obtained by Hessari et al. (8). These results could be related to positive attitude and better dental awareness in educated people.

As a conclusion the results of this study support an association between DMFT and BMI. Obesity and dental problem are issues of concern among the elderly population in Khuzestan province. There is need to develop policies that will look into the nutrition and dental health of the elderly in order to improve their welfare.

### **Acknowledgements**

The research was supported by Khuzestan Health Center and Vice-Chancellor for Health Affairs of Ahvaz Jundishapur University of Medical Science. The authors declare that there is no conflict of interests.

### **References**

1. Nguyen DM, H S (2010). The epidemiology of obesity. *Gastroenterol Clin North Am*, 39.

2. Ayatollahi S, Carpenter R (1993). Height, Weight, BMI and weight for height of adults in southern Iran: how should obesity be defined. *Ann Hum Bio*, 20:13-9.
3. Becker T, Levin L, Shochat T, Einy S (2007). How much does the DMFT index underestimate the need for restorative care? *J Dent Educ*, 71:677-81.
4. Momeni A, Mardi M, Pieper K (2006). Caries prevalence and treatment needs of 12-year-old children in the Islamic Republic of Iran. *Medical Principles and Practice*, 15:24-28.
5. Williams CL, Hayman LL, Daniels SR, Robinson TN, Steinberger J, Paridon S, Bazzarre T (2002). Cardiovascular health in childhood: A statement for health professionals from the Committee on Atherosclerosis, Hypertension, and Obesity in the Young (AHOY) of the Council on Cardiovascular Disease in the Young, American Heart Association. *Circulation*, 106:143-60.
6. Sheiham A (2006). Dental caries affects body weight, growth and quality of life in preschool children. *Br Dent J*, 201:625-6.
7. Kantovitz K, Pascon A, Rontani R, Gavião M (2006). Obesity and dental caries : a systematic review. *Oral Health Prev Dent*, 4:137-44.
8. Hessari H, Vehkalahti MM, Eghbal MJ, Murto-maa HT (2007). Oral health among 35- to 44-year-old Iranians. *Med Princ Pract*, 16:280-5.