# Abdominal Obesity and Dental Caries among Woman in Baghdad City / Iraq (Cross Sectional Study)

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**Abstract:** _Background: Abdominal fats imply greater health risk than peripheral fats. Dental caries and obesity are multifactorial diseases and associated with dietary habits. Aims of the study: This study was designed to determine the prevalence of abdominal obesity and dental caries among female teachers in Baghdad city in addition to the relation between them. Subjects and methods:This study was conducted in female's secondary schools of Baghdad city, among females teachers with age range 29-39 years old. Abdominal obesity was determined by waist hip ratio examination. Teachers were divided into three groups (health weight, overweight and obese) according to waist hip ratio measurements.Caries experience was determined by the Decayed- Missing – Filled Surfaces (DMFS) index. Results: the total sample was 534 women. The results showed that the highest percentage of the teacher was obese and the lowest percentage was with healthy weight. No statistical significant differences were found in mean values of caries- experience among the groups of the waist hip ratio classificationsConclusion:high percentage of abdominal obesity may light the need for dietary habits adjustment among women to reduce the possible health outcome. Further studies are needed to clear the relations between abdominal obesity and dental caries._

**Keywords:** waist hip ratio, abdominal obesity, dental caries

## 1. Introduction

Abdominal fats imply greater health risk than peripheral fats and waist circumference is considered as important complementary risk measure [1]. In previous study, it was concluded that waist circumference is a potent risk factor for ischemic stroke and a stronger risk factor than body mass index[2] and has a greater effect among younger persons. Waist circumference and waist-hip ratio appear to be more strongly associated with metabolic risk factors and death [3].

For Middle East (Arab) populations, waist circumference should be less than 94 cm formale andless than 80 cm for female. For women,Waist circumference of 80-87.9 cm is classified as overweight and with ≥88.0 cm is classified as obese [4]. The waist-hip ratio has been proposed as a good measurement for use across all ethnic groups [5]. According to World Health Organization, abdominal obesity is further defined as waist-hip ratio above 0.90 for males and above 0.85 for females [6].

Since dental caries and weight status have common risk determinants, dental caries was studied in relation to body weight by using different anthropometric measurements, proposing that both dental caries and obesity are multifactorial diseases and associated with dietary habits [7, 8].

Waist circumference and waist hip ratioare studied in relation to dental caries. In previous study, it was concluded that the number of teeth present and restored were associated with both total and abdominal adiposity[9] while the results of another studyshowed that dental caries experience was associated with central obesity but not with general obesity[10].

This study was designed to determine 1) the prevalence of abdominal obesity among female teachers in Baghdad city 2) the prevalence of dental caries in the target group according to the categories of abdominal obesity.

## 2. Subjects and Methods

This study was conducted among teachers in female's secondary schools of Baghdad city (urban only). A legal permit was obtained from the Ministry of Education to conduct clinical examinations during school hours. Permission was obtained from Ministry of Education to have a list of schools. Only females teachers with age range 29-39 years old and no history of systemic diseases were included in the study. Random cluster sampling technique was used in present study in which all the teachers within the selected age were examined in the randomly selected school.

All the following procedures of measurements were according to National Health and Nutrition Examination Surveys [11].The teachers were instructed to stand on their right side with their feet close together and remove any heavy clothes. The hip area was palpated to locate the right ilium of the pelvis. The measuring tape was extended around the waist in a horizontal plane at the level just above the uppermost lateral border of the right ilium. The measurement was taken to the nearest 0.5 centimeter at the end of the normal expiration.At the same procedure described in waist circumference measurement (except tape position), hip circumference was taken at the level of the maximum protrusion of the buttocks in the horizontal plane. The measurement was taken to the nearest 0.5 centimeter.Waist hip ratio (WHR) is obtained by dividing the waist circumference by hip circumference. In the current

study, WHR of 0.80-0.84 is classified as overweight and with WHR ≥ 0.85 is classified as obese [12].

Caries experience in the present study was determined by the Decayed- Missing – Filled Surfaces (DMFS) index by WHO[13] in which all teeth are examined and all third molars were included. Plain mouth mirror and WHO probe were used in the examination

## 3. Results

A total of 534 women were examined in the current study. The distribution of the teachers according to abdominal weight status or the waist hip ratio (WHR) is seen in Table 1. The results showed that the highest percentage of the teacher was obese (58.24%) and the lowest percentage was with healthy weight (18.16%).

Table 2 shows the differences in caries experience among teachers according to the Waist hip ratio. The mean value of decayed surfaces (DS) was highest in overweight group and the lowest in healthy weight group while mean value of missing surfaces (MS) was highest in obese group and the lowest in healthy group. In addition to that, the filed surfaces (FS) showed highest mean value in the healthy weight group and the lowest mean in overweight group. As a result of that, the mean value of DMFS was the highest in obese group and the lowest in healthy weight group. However, no statistical significant differences were found in mean values of caries-experience among the groups of the WHR classifications.

## 4. Discussion

According to WHR classifications, highest percentage of the teacher was obese. In another Iraqi study, the prevalence of abdominal obesity was 51.5% for women. Although the percentage of obesity that reported in this study was higher than the percentages reported in another Iraqi study [14], differences in criteria of sample collection regarding the job and age rangecould be the most possible causes. However, this percentage may light the need for dietary habits adjustment among women to reduce the possible health outcome.

Although the mean value of DMFS was the highest in obese group and the lowest in healthy weight group, no statistical significant differences were found in mean values of DMFS among the groups of the WHR classifications. This result disagrees with other studies that reported the association between dental caries and the abdominal obesity [9,10]. The different factors (behavioral and biological risk factors) associated with abdominal fat accumulation could responsible for this disagreement. Genetics, hormonal levels, dietary habits and physical inactivity have been correlated to abdominal obesity [15]. In addition to that,women may change their habits to reduce body weight, resulting in a change in WHR values while the mean values of DMFs will remain high because this index considers caries throughout the individuals' lives [16].

However, many factors should be considered to explain the relationship between obesity and dental caries such as dietary factors and oral hygiene measures. Furthermore, it is important to study the contribution of salivary parameters in caries experience of overweight or obese patients. Further studies are needed to confirm the finding of the present study and to clear the relations between abdominal obesity and dental caries.

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**Table 1:** Distribution of the teachers according to abdominal obesity

| WHR | No. | % | Mean ± SE |
|---|---|---|---|
| Healthy weight | 97 | 18.16 | 0.74 ± 0.003 |
| Over weight | 126 | 23.60 | 0.82 ± 0.001 |
| Obese | 311 | 58.24 | 0.91 ± 0.002 |
| Total | 534 | 100 | 0.86 ± 0.003 |

**Table 2:** Caries experience DMFS and its components (DS, MS, FS) among teachers according to abdominal obesity

| WHR | Caries experience | | | |
|---|---|---|---|---|
| | DS | MS | FS | DMFS |
| | Mean ±SE | Mean ±SE | Mean ±SE | Mean ±SE |
| Healthy weight | 4.53± 0.57 | 7.58± 0.93 | 9.34± 0.91 | 21.44± 1.53 |
| Overweight | 4.99± 0.48 | 8.10± 0.84 | 8.37± 0.72 | 21.46± 1.33 |
| Obese | 4.91± 0.35 | 9.94± 0.65 | 8.97± 0.45 | 23.82± 0.92 |
| F value (df=2, 531) | 0.191 | 2.478 | 0.406 | 1.458 |
| P value | 0.826 | 0.085 | 0.667 | 0.234 |