

Personality Types in relation to dental caries and salivary testosterone among teachers in Baghdad city

Raya Rashid Al-dafaai, B.D.S, M.Sc. ⁽¹⁾

Ban Sahib Diab, B.D.S, M.Sc., Ph. D. ⁽²⁾

Huda Jameel Abd Al- Ghani, M.A. Ph. D. ⁽³⁾

ABSTRACT:

Background: Personality could be defined broadly as those characteristics of individuals that describe the pattern of feeling, cognition and behaving. Personality types can be measured by using one of personality type's measures. Personality has been proposed to influence the oral health. The purpose of the present study was to assess the influence of Personality Types on caries experience in relation to salivary testosterone hormone among teachers in Baghdad city.

Materials and Methods: Female teachers (n=534) of randomly selected schools were subjected to personality questionnaire using The Riso-Hudson Enneagram Type Indicator. Teachers were examined to estimate the caries experience according to the decayed-missing and filled index (DMFS). A group of teachers were randomly selected from the total sample for salivary analysis of testosterone. Data were analyzed using SPSS version 18 software. A probability value less than 0.05 was considered to be statistically significant.

Results: Data analysis showed that the higher percentage of teachers was Helpers as the dominant Type. The results showed statistical high significant differences in mean values of DMFS among the nine Personality Types. No significant correlation was found between salivary testosterone concentration (pg /ml) with the scores of the Nine Personality Types. No significant correlation was found between salivary testosterone concentration (pg/ml) and caries experience.

Conclusions: The identification of Personality Types and their relations with dental caries can permit the assessment of the individual's susceptibility and facilitate the improvement of the individual's oral health.

Keywords: Personality Types, caries experience, salivary testosterone. (Received: 15/11/20115; Accepted: 13/12/2015)

INTRODUCTION

Riso and Hudson defined personality as “a collection of internal defenses and reactions, beliefs and habits about self and world that have come from childhood experience where the heredity factors predispose child to have certain temperament”. They developed Riso-Hudson Enneagram Type Indicator (RHETI) to be a scientifically validated forced-choice Personality Types test with 144 paired statements ⁽¹⁾.

Dental caries is “a complex disease caused by a physiological imbalance between fluid and mineral dental biofilm which is also known as plaque” ⁽²⁾. Psychological factors have been paid attention in relation to dental caries. During the last decades, researchers tried to find the relationship between caries and personality ^(3, 4). Later on, it was suggested that personality is a risk factor with respect to dental caries and should be considered when using patients' reports ⁽⁵⁾.

Psychological wellbeing and a lack of stress have been attributed to health maintenance. Thus, biological factors can be influenced by psychological factors in the development of chronic diseases like dental caries ⁽⁶⁾.

Various factors can influence the experience of stress in the individual like person's perception of the situation, past experiences, the presence or absence of social support, and individual differences such as motivation, attitudes, and personality ⁽⁷⁾.

Stress has been studied in relation to dental caries in different studies ^(8, 9, 10). It was suggested that the association between stress and prevalence of caries could be attributed to salivary changes in flow rate and composition ⁽¹¹⁾.

One of the important effects of stress is the reduction in testosterone production. Researches indicated that elevations in cortisol lowered testosterone ⁽¹²⁾. Stressful situations as experienced during work have been shown to decrease testosterone levels ⁽¹³⁾. The production of testosterone in women is much smaller than in men, but these small amounts have crucial role in the health and well-being of women. Testosterone is important in the growth and maintenance of skeletal muscle, and may play a significant role in the maintenance of bone mass and inhibit osteoclastic function ⁽¹⁴⁾. Testosterone can relieve anxiety and depression, and promotes clearer thinking. Low level of this hormone was observed in female with depressive disorder and anxiety disorder ⁽¹⁵⁾.

No previous study was conducted to determine the effect of different Personality Types on dental caries and few reports regarding salivary

1. lecturer. Department of Preventive Dentistry, University of Baghdad.

2. Assist. Prof. Department of Preventive Dentistry, University of Baghdad.

3. Assist. Prof. psychological research center, University of Baghdad.

testosterones have been presented in the dental field^(16, 17). This study was designed to investigate the influence of Personality Types on the caries experience of secondary schools teachers and salivary testosterone concentration.

MATERIALS AND METHODS

The target population of this study was females teachers aged between 29 and 39 years. Secondary schools of females were randomly selected in Baghdad city, (urban only). Riso-Hudson Enneagram Type Indicator (RHETI), Version 2.5, was used to determine the basic Personality Type and the scores of the nine Personality Types of human nature for each teacher⁽¹⁾.

The (RHETI) was translated to Arabic and prepared to be used in Iraq by AL-Yassiry in 2004⁽¹⁸⁾. It requires from each teacher to choose one statement in each pair that best describes her throughout most of life. Each chosen statement has a score of one while the non-chosen statement has a score of zero. After collection of the scores, each teacher had nine scores of the nine Personality Types and each Personality Type should have a score range (0-32). The total scores for the nine types should equal to 144. The higher score represented the basic Personality Type for the teacher. Caries experience was determined by Decayed- Missing – Filled Surfaces (DMFS) index by WHO (1997) in which all teeth were examined and all third molars were included⁽¹⁹⁾. Plain mouth mirror and CPI probe were used in the examination. A group of teachers (87) was randomly selected from the total sample according to the basic personality type for analysis of salivary testosterone. Saliva collection, storage and analysis were according to the manufacturer instructions (Demeditec Diagnostics GmbH, Germany). Data were statistically analyzed using

SPSS version 18 software. A probability less than 0.05 ($P < 0.05$) was considered to be statistically significant.

RESULTS

A sample of 534 teachers from 55 schools was examined, distributed throughout the six directorates of Baghdad city, urban only. The total scores for each Personality Type were calculated from the indicator sheets. The higher score represented the basic Personality Type for each teacher. By dividing the total sample according to the higher score for each teacher or the Basic personality Type, the highest percentage was found for the Helper followed by the Peacemaker and the Achiever Personality Types while the lowest percentage was for the Enthusiast (Table 1).

The differences in caries experience among teachers according to the Basic Personality Types are revealed in Table 2. The results show statistical high significant differences in mean values of DMFS among the nine Personality Types where The Achiever showed the lowest mean of DMFS. Further analysis by Games-Howell test (post hoc) showed that the significant differences in the (decayed, missing, filled surfaces) DMFS were found between the Achiever Type with the Reformer (m.d.=8.03, P value=0.01), the Helper (m.d.=11.28, P value=0.00) and the Peacemaker (m.d.=12.16, P value=0.00).

Table 3 is showing the correlation coefficient between the concentrations of salivary testosterone and the scores of the Nine Personality Types. No significant correlations were found between the concentrations of the salivary testosterone and the scores of the nine Personality Types. No significant correlation ($P > 0.05$) was also found between the salivary testosterone and caries experience ($r = -0.12$, $P = 0.26$).

Table (1): The distribution of the teachers according to the Basic Personality Types

Basic Personality types	No.	%
The Reformer	66	12.36
The Helper	162	30.34
The Achiever	67	12.54
The Individualist	20	3.74
The Investigator	19	3.56
The Loyalist	49	9.18
The Enthusiast	14	2.62
The Challenger	50	9.36
The Peacemaker	87	16.30
Total	534	100%

Table (2): The differences in caries experience (mean \pm SE) among teachers according to the Basic Personality Types

Basic Personality Types	DMFS (mean \pm SE)
The Reformer	22.56 \pm 1.97
The Helper	25.80 \pm 1.22
The Achiever	14.52 \pm 1.06
The Individualist	24.80 \pm 4.37
The Investigator	20.47 \pm 2.25
The Loyalist	18.51 \pm 2.12
The Enthusiast	28.86 \pm 5.16
The Challenger	20.64 \pm 2.37
The Peacemaker	26.69 \pm 1.826
F value	4.85**

**highly significant ($P \leq 0.01$), $df=8$

Table (3): Correlation Coefficient between salivary Testosterone concentrations (pg/ml) and the scores of the Nine Personality Types

Scores of Personality types	Testosterone (pg/ml)	
	r	P
The Reformer	-0.02	0.79
The Helper	0.18	0.08
The Achiever	-0.04	0.70
The Individualist	-0.05	0.64
The investigator	-0.05	0.61
The loyalist	0.10	0.32
The Enthusiast	0.08	0.42
The Challenger	-0.14	0.18
The Peacemaker	-0.03	0.73

DISCUSSION:

Since there are no previous studies in Iraq on the relationship between Personality Types and oral health status, this study was conducted to focus on the relation between Personality Types and caries experience. Female teachers were the target group in this study. Some caries risk factors may place women at higher risk to develop dental caries. These factors include dietary habits, hormonal fluctuation, genetic variation, differences in saliva composition and flow rate between male and female⁽²⁰⁾. Pregnancy may explain some of gender differences in dental caries due to factors related to

the changes in mouth flora and saliva, vomiting, neglected oral hygiene, and nutritional changes⁽²¹⁾. However, women have the responsibility of food preparation and easier access to foods and snacks outside of mealtime. Psychological factors also may explain caries experience among women as they are more subjected to stress, domestic violence and eating disorders^(22, 23).

The current study showed significant differences in the decayed, missing and filling surfaces (DMFS) between the Achiever Type and six Personality Types: the Reformer, the Helper,

the Individualist, the Enthusiast, the Challenger and the Peacemaker. From the basic description of the Achiever Personality Type, the Achievers are healthy, charming, successful, highly concerned with their performance. Self-assured, energetic and motivating others⁽²⁴⁾. This description may lead them to be more concerned in their health status and especially oral health status. The psychological wellbeing and the less stressful personality may have distinctive biological correlates that can benefit health regarding the oral immunity and salivary changes.

The study showed no significant correlations were found between the concentrations of the salivary testosterone and the scores of the nine Personality Types. This result disagrees with the

REFERENCES:

- Riso D R, Hudson R. Understanding the Enneagram: The Practical Guide to Personality Types. Boston, New York: Houghton Mifflin; 2000.
- Fejerskov O. Changing paradigms in concepts on dental caries: consequences for oral health care. *Caries Res* 2004; 38(3):182-191.
- Hyams IB. Personality factors and dental caries. *Journal Canadian Dental Association* 1948; 14(9):473.
- Manhold JH, Rosenberg N. Study of the Possible Relationship of Personality Variables to Dental Cavities. *J Dent Res* 1954; 33: 357-363.
- Thomson WM, Avshalom C, Richie P, Terrie E, Jonathan M. Personality and oral health. *Eur J Oral Sci* 2011; 119(5): 366-372.
- Costal SM, Vasconcelos M, Haddad JP, Abreu MH. The severity of dental caries in adults aged 35 to 44 years residing in the metropolitan area of a large city in Brazil: a cross-sectional study. *BMC Oral Health* 2012, 12:25.
- Slocum J W, D Hellriegel. Fundamentals of organizational behavior. Mason, OH: Thomson; 2007.
- Marcenes WS, Sheiham A. The relationship between work stress and oral health status. *Soc Sci Med*. 1992; 35(12):1511-1520.
- Mejía-Rubalcava C, Alanís-Tavira J, Argueta-Figueroa L, Legorreta-Reyna A. Academic stress as a risk factor for dental caries. *International Dental Journal* Volume 2012; 62(3): 127-131.
- Bhushan K; Prabhdeep K Sandhu2, Dr Shaiba Sandhu. Psychological stress related oral health problems- dental perspective. *IJRID* 2014; 4 (3).
- Pagare SS, Nayak CD, Kaur A. to analyze perceived stress and its relation to dental caries: a study. *Scientific Journal* 2009; 3.
- Brownlee KK, Alex W. Moore1 and Anthony C. Hackney. Relationship between circulating cortisol and testosterone: influence of physical exercise. *Journal of Sports Science and Medicine* 2005; 4, 76-83.
- M Zitzmann M, Nieschlag E. Testosterone levels in healthy men and the relation to behavioral and physical characteristics: facts and constructs. *European Journal of Endocrinology* 2001; 144: 183-197.
- Kasperk CH, Wakley G, Hierl T, Ziegler R. Gonadal and adrenal androgens are potent regulators of human bone cell metabolism in vitro. *J Bone Miner Res* 1997; 12:464-471.
- Giltay EJ, Dorien E B, Frans G, Zitman A, Brenda WJH, et al. Salivary testosterone: Associations with depression, anxiety disorders, and antidepressant use in a large cohort study. *Journal of Psychosomatic Research* 2012; 72: 205-213.
- Delman LA. Effect of gonadectomy on dental caries: review of the literature. *J Am Dent Assoc* 1955; 51:155-158.
- Laine M, Tenovuo J, Lehtonen OP, Ojanotko-Harri A, ViljaP, Tuohimaa P. Pregnancy-related changes in human whole saliva. *Arch Oral Biol* 1988; 33:913-917.
- Al Yassiry M. the nine Personality Types of the Enneagram. Master thesis submitted to the college of education, university of Baghdad, 2004.
- World Health Organization (WHO): Oral Health Surveys, Basic Methods. 4th ed. Geneva; 1997.
- Halpern LR, Kaste LM. Evidence-Based Women's Oral Health, an Issue of Dental Clinics. Elsevier Health Sciences 2013.
- Silk H, Douglass A, Douglass JM, Silk L. Oral Health during Pregnancy. *Am Fam Physician* 2008; 77(8):1139-1144.
- Ferraro M and Vieira AR. Explaining Gender Differences in Caries: A Multifactorial Approach to a Multifactorial Disease. *International Journal of Dentistry* 2010; 2010: 5 pages.
- Lukas JR, Largaespada LL. Explaining sex differences in dental caries prevalence: Saliva hormones and life history etiologies. *Am J Hum Biol* 2006; 18: 540-555
- Riso D R, Hudson R. The Wisdom of the Enneagram: The Complete Guide to Psychological

- and Spiritual Growth for the Nine Personality Types. New York: Bantam Books; 1999. P. 153-155.
25. Stelmack SR. On the Psychobiology of Personality: Essays in Honor of Marvin Zuckerman. Elsevier; 2004. P.353.
26. Zuckerman, M. Psychobiology of personality. 2nd, revised and updated. New York: Cambridge University Press, 2005

الخلاصة

المقدمة: تعرف الشخصية بصورة عامة بانها مجموعة من الخصائص التي تصف الافراد من حيث مشاعرهم , ادراكهم و تصرفاتهم. يمكن الاستعانة باحدى مقاييس الشخصية للتعرف على شخصية الفرد او نمطه ، والتي سوف تساعدنا في التعرف على علاقتها بصحة الفم. تهدف هذه الدراسة التعرف على تأثير انماط الشخصية على تسوس الاسنان وعلاقته باحدى هرمونات اللعاب (testosterone) لدى مدرسات المرحلة الثانوية في مدينة بغداد.

المواد وطرق العمل: تضمنت الدراسة مشاركة عينة مكونة من 534 من مدرسات المرحلة الثانوية في مدينة بغداد ، اللواتي اجبن على مقياس ريسو-هيودسن للانماط التسعة للشخصية-الإنكزام. تم اجراء الفحص للعينة ذاتها لتقويم تسوس الاسنان باستخدام مؤشر التسوس DMFS و تم اختيار مجموعة من المدرسات عشوائيا لاخذ عينة اللعاب وقياس تركيز احدى هرمونات اللعاب (testosterone).

النتائج: اظهرت الدراسة ان النسبة المؤية الاكبر للمدرسات كان لديهم نمط الشخصية السائد هو النمط المساعد. واطهرت النتائج وجود فرق معنوي بمتوسط الدرجات المحسوبة لتسوس الاسنان بين الانماط التسعة للشخصية. لم تظهر الدراسة اي ارتباط معنوي بين تركيز الهرمون الذكري (testosterone) في اللعاب والدرجات المحسوبة للانماط التسعة. لم تظهر الدراسة ايضا اي ارتباط معنوي بين تركيز الهرمون في اللعاب ومؤشرات مقياس تسوس الاسنان (DMFS).

الاستنتاج: التعرف على انماط الشخصية وعلاقته بتسوس الاسنان قد يساعد على تفسير الاختلاف في نسبة انتشار التسوس بين الافراد و تقويم قدرة الافراد لتحسين صحة الفم والاسنان