

Relationship Between Personality and Satisfaction With the Dentition in Tooth Wear Patients

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Abstract - This study was undertaken to identify whether personality traits had any relationship with patients' satisfaction with their dentition in tooth wear cases. One hundred tooth wear patients and one hundred controls were recruited into the study. A Dental Impact on Daily Living questionnaire was used to assess impact of tooth wear on day to day life and satisfaction with the dentition. An ordinal scale was used to assess tooth wear severity in tooth wear patients. The NEO Five Factor inventory was used to assess personal profiles. Tooth wear patients were less satisfied with their dentition, had higher Neuroticism, lower Extraversion, and higher Openness than the controls.

KEY WORDS: Tooth surface loss, Tooth wear, Satisfaction

INTRODUCTION

Dental disease may influence an individual's capacity to live comfortably, be successful in employment, enjoy life, experience relationships, and possess a positive self-image¹. Although dental disease is rarely life threatening, it can still affect the overall quality of life. Pain, speech, aesthetics, chewing and eating all have definite impacts on life quality^{2,3}. Different levels of oral status can affect people's daily living, therefore, clinical status and psychological dimensions should be addressed whenever dental needs are assessed^{2,4}.

Personality traits have been shown to impact on patients' opinion of their dento-facial aesthetics⁵. Self-confidence, self-esteem, and obedience are important determinants for patient satisfaction with aesthetic treatment⁶. Psychosocial factors have an important role in determining patient compliance and satisfaction with dental status and treatment^{7,8}, which in turn can be correlated and predicted by certain personality traits such as self-esteem, self-confidence, obedience, accommodating, calmness, extroversion, anxiety, warmth, neuroticism, and conscientiousness^{5,6,9}.

Patients' perceptions and satisfaction affect their behaviour¹⁰. It has been shown that personal attributes, self-perceptions, behaviour, psychology, and social interactions all improved with increased patient satisfaction with their dental status after receiving aesthetic dental treatment^{11,12}.

Personality factors may be involved in the aetiology of certain somatic diseases and provoke physical symptoms. They might contribute to the aetiology of some oro-facial diseases and cause physical symptoms. Diagnosis and understanding of patients' personality profiles and control of personality factors might help in the management of these diseases or symptoms. The aim of this study was to investigate the relationship between personality profiles as

determined by the NEO-five factor inventory with satisfaction with the dentition in a cohort of patients referred to a tooth wear clinic.

MATERIALS AND METHODS

Ethical approval for this study was granted prior to starting the investigation.

One hundred consecutive patients referred to a tooth wear clinic at the Department of Restorative Dentistry, Queen's University Belfast were recruited into this study.

A Tooth Wear Assessment Questionnaire¹³ was completed for each patient, and details of the patient's dental and medical history and presenting complaints were recorded. Personal information relating to name, age, sex, education, occupation, address, marital status, height, and weight was gathered. Patients were then clinically examined by one operator who had previously been calibrated, and the severity of tooth wear was scored on an ordinal scale¹⁴ where 1 indicated mild enamel wear and 4 severe wear involving secondary dentine.

An assessment of patient satisfaction was undertaken using the Dental Impact on Daily Living Questionnaire (DIDL)^{2,15}. This investigates 5 major categories relating to the 5 major dimensions of dental satisfaction namely; appearance, pain, oral comfort, general performance and chewing and eating. The patient response is indicated as positive if agreeing with the item, negative if disagreeing, or neutral if undecided.

The DIDL scale measures the impact (weight) of the dimension for the patient, and is scored from 0 to 10, the final total score of the questionnaire being equal to the sum of final scores for the 5 dimensions.

The total score of the questionnaire ranged from -1 to +1 in all sample individuals. Those who scored below 0 were considered as the dissatisfied group, while those who scored between 0 and 0.69 were relatively satisfied, and those who scored above 0.69 were satisfied. This distribution is arbitrary except for the dissatisfied group who scored below 0^{2,15}.

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Assessment of patients' personality profiles and traits was carried out using the NEO Five Factor Inventory (NEO-FFI) ¹⁶. This test provides a comprehensive assessment of personality using 5 major domains and 30 facet scales. The test consists of 60 items, 12 for each domain, and the response to each item is chosen from 5 answers.

The NEO-FFI is short, highly valid and reliable, it is easy to answer and score, easy for the researchers to interpret, able to tackle the 5 dimensions of personality accurately, and is well documented in the literature ^{17,18,19,20}.

One hundred matched control subjects were recruited into this study. They were recruited from a Northern Ireland population and were all clinically assessed to exclude oral and dental diseases especially pathological tooth wear.

Pearson correlation, ANOVA, and linear regression analysis were used to analyze the data. All data analysis was performed using the SPSS computer software version 11.0 (SPSS, Inc., Chicago, USA).

RESULTS

Sixty three males and 37 females were recruited into the study. One hundred age and gender matched control subjects were also recruited. Age of the patients ranged from 18 to 60 years with a mean of 39 years and standard deviation of 14.4. Age of the control subjects ranged from 18 to 60 years and were similar to those of the tooth wear patients group.

Levels of patients' education ranged from primary to tertiary education with 11 patients having received primary education (up to age 16 years), 71 patients secondary education (up to A level), and 18 tertiary education (university or college). Levels of control subjects' education ranged from primary to tertiary education and were similar to those of the tooth wear patients group.

Two patients had grades 0 to 1 {mild} tooth wear, 52 patients had grade 2 {moderate} and 46 patients had grades 3 to 4 {severe}.

Satisfaction scores in the study sample

Total satisfaction scores of the DIDL questionnaire showed that 38% of tooth wear patients were dissatisfied with their teeth and scored below 0, 52% were relatively satisfied and scored between 0 and 0.69, and 10% were totally satisfied with their teeth. The highest total satisfaction score was +1 while the lowest total satisfaction score was -0.6419 with a mean of 0.1814 for total satisfaction score and SD of 0.39.

For the control group it was found that 4% of the control subjects were dissatisfied with their teeth and scored below 0, 30% were relatively satisfied and scored between 0 and 0.69, and 66% were totally satisfied with their teeth. The highest total satisfaction score was +1 while the lowest total satisfaction score was -0.2664 with a mean of 0.7162 for total satisfaction score and SD of 0.31. Table 1 summarizes the satisfaction with each dimension of the DIDL questionnaire in both the patients and control groups.

NEO-FFI scores in the study sample

The scores of each of the personality domains (Neuroticism, Extraversion, Openness, Agreeableness, and Conscientiousness) in the study sample are shown in Table 2. For the tooth wear patients, age was found to have a negative correlation to satisfaction with eating, and to Extraversion, and positive correlation to Conscientiousness ($p=0.01$, 0.037 , and 0.000 respectively). The level of education was positively correlated to Openness scores ($p=0.014$). Females were found to score higher in Neuroticism ($p=0.013$). (Table 3)

Table 1. Scores of individual satisfaction dimensions in the study sample

Dimension	Dissatisfied (%)		In between (%)		Satisfied (%)	
	Patients	Control	Patients	Control	Patients	Control
Appearance	78	9	4	5	18	86
Pain	23	7	10	5	67	88
Oral comfort	19	5	14	2	67	93
General performance	19	4	4	0	77	96
Eating and chewing	31	6	13	6	56	88

Table 2. Personality dimensions scores in the study sample

Personality Domain	Low score (%)		Average score (%)		High score (%)	
	Patients	Controls	Patients	Controls	Patients	Controls
Neuroticism	14	24	32	42	54	34
Extraversion	31	24	51	44	18	32
Openness	51	32	30	43	19	25
Agreeableness	43	36	40	34	17	30
Conscientiousness	35	45	46	38	19	17

Table 3. Correlations between satisfaction and personality scores and personal factors in the study sample

	Age		Gender		Education	
	Patient	Control	Patient	Control	Patient	Control
Total satisfaction						
Pearson correlation coefficient	-0.135	-0.171	-0.124	-0.184	0.017	-0.027
Significance (2-tailed)	NS*	NS*	NS*	NS*	NS*	NS*
Appearance						
Pearson correlation coefficient	-0.037	-0.160	0.059	-0.329	0.029	-0.083
Significance (2-tailed)	NS*	NS*	NS*	0.001	NS*	NS*
Pain						
Pearson correlation coefficient	-0.077	-0.004	-0.105	-0.037	-0.046	-0.135
Significance (2-tailed)	NS*	NS*	NS*	NS*	NS*	NS*
Oral comfort						
Pearson correlation coefficient	0.035	-0.131	0.111	-0.117	-0.032	0.030
Significance (2-tailed)	NS*	NS*	NS*	NS*	NS*	NS*
General performance						
Pearson correlation coefficient	-0.076	-0.120	-0.117	-0.161	-0.096	0.217
Significance (2-tailed)	NS*	NS*	NS*	NS*	NS*	0.03
Eating						
Pearson correlation coefficient	-0.250	-0.159	-0.144	-0.054	-0.036	0.003
Significance (2-tailed)	0.012	NS	NS*	NS*	NS*	NS*
Neuroticism						
Pearson correlation coefficient	-0.146	-0.227	0.249	0.118	0.001	0.044
Significance (2-tailed)	NS*	0.023	0.013	NS*	NS*	NS*
Extraversion						
Pearson correlation coefficient	-0.208	-0.006	0.076	-0.146	0.131	-0.039
Significance (2-tailed)	0.037	NS*	NS*	NS*	NS*	NS*
Openness						
Pearson correlation coefficient	-0.07	-0.067	0.045	-0.028	0.244	0.04
Significance (2-tailed)	NS*	NS*	NS*	NS*	0.014	NS*
Agreeableness						
Pearson correlation coefficient	0.193	0.102	0.150	0.304	-0.044	-0.014
Significance (2-tailed)	NS*	NS*	NS*	0.002	NS*	NS*
Conscientiousness						
Pearson correlation coefficient	0.344	0.237	-0.013	0.154	-0.119	-0.039
Significance (2-tailed)	0.000	0.018	NS*	NS*	NS*	NS*

*NS= Not significant.

Tooth wear severity was positively correlated to age ($p=0.005$) but had no significant correlation to any of the satisfaction or personality scores (Table 4). Neuroticism was found to be negatively correlated to total satisfaction scores as well as satisfaction with appearance ($p=0.002$ and 0.02 respectively). Extraversion showed a positive correlation to satisfaction with appearance ($p=0.011$). Conscientiousness had a negative correlation to satisfaction with eating ($p=0.004$). (Table 5)

In the control group; age was found to have a negative significant correlation to the Neuroticism score ($p=0.023$) and a positive significant correlation to the Conscientiousness score ($p=0.018$). Females were found to have lower scores for satisfaction with the appearance dimension ($p=0.001$) and to have higher scores of Agreeableness ($p=0.002$). The higher the level of education the higher the scores for satisfaction with general performance ($p=0.03$). (Table 3)

Neuroticism was found to have negative significant correlation to total satisfaction with the dentition ($p=0.002$) as well as to satisfaction with general performance ($p=0.005$). (Table 5)

Comparison between the groups

The total satisfaction score and all individual dimension satisfaction scores were significantly different between the groups (ANOVA). The control group showed more satisfaction with their dentition than the tooth wear patients group. Total satisfaction, appearance, pain, comfort, general performance, and eating satisfaction scores were found to be significantly different between groups ($p<0.001$). (Table 6)

Scores for Neuroticism, Extraversion, and Openness personality traits were found to be significantly different between groups. The tooth wear patients group had higher scores for Neuroticism ($p=0.029$), lower scores for Extraversion ($p=0.017$), and lower scores for Openness ($p=0.007$). (Table 6)

DISCUSSION

The purpose of this study was to investigate the relationship between personality profiles and satisfaction with

Table 4. Correlations between wear severity and personal factors, satisfaction scores, and personality traits

	Tooth wear severity	
	Pearson correlation coefficient	Significance (p=)
Age	0.280	0.005
Gender	-0.145	Not significant
Education	0.025	Not significant
Total satisfaction	-0.194	Not significant
Appearance	-0.009	Not significant
Pain	-0.192	Not significant
Oral comfort	-0.156	Not significant
General performance	-0.059	Not significant
Eating and chewing	-0.126	Not significant
Neuroticism	-0.101	Not significant
Extraversion	-0.022	Not significant
Openness	-0.057	Not significant
Agreeableness	-0.005	Not significant
Conscientiousness	0.055	Not significant

Table 5. Correlations between personality dimensions scores and satisfaction scores in the study sample

	Neuroticism		Extraversion		Openness		Agreeableness		Conscientiousness	
	A	B	A	B	A	B	A	B	A	B
Total										
r =	-.305	-.308	.192	.133	-.085	.152	.039	-.087	-.082	-.013
P =	.002	.002	NS	NS	NS	NS	NS	NS	NS	NS
APP										
r =	-.228	-.052	.255	-.044	-.067	.001	.072	-.073	-.069	-.127
P =	.022	NS	.011	NS	NS	NS	NS	NS	NS	NS
Pain										
r =	-.178	-.123	.095	.107	-.042	.069	.005	-.043	.033	.015
P =	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Comf										
r =	-.188	-.065	.054	.073	-.157	.161	.077	-.007	.018	-.123
P =	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
G_PER										
r =	-.040	-.279	-.155	.112	.023	.082	-.003	-.06	-.099	.027
P =	NS	.005	NS	NS	NS	NS	NS	NS	NS	NS
Eating										
r =	-.043	-.148	.077	.002	-.059	.155	-.166	-.125	-.285	-.165
P =	NS	NS	NS	NS	NS	NS	NS	NS	.004	NS

A= Tooth wear patients group, B= Control subjects group, r = Pearson correlation coefficient, p= significance of the correlation using 2-tailed t-test, Total= Total satisfaction scores, APP= Appearance, Comf= Oral comfort, G_PER= General performance, NS= Not significant.

the dentition in a tooth wear population. The Neo Five Factor Inventory was chosen as the instrument to assess personality as it provides a comprehensive assessment of personality, is short, easily administered and is highly valid and reliable. Other personality tests eg Eysenck Personality Questionnaire, Minnesota Multiphasic Personality Inventory or Cattell 16 Personality Factor tests give the patients a very narrow scale to indicate the range of his response while NEO-FFI gives 5 answer categories thus providing a wider range of response for the patients. It also allows easier correlations and thus creates fewer statistical problems.

The socio-dental instrument the Dental Impact on Daily Living was used in this study to assess satisfaction with

the dentition. As impacts seldom occur separately, a single impact score is given to assess total oral impact. Unlike instruments such as the Oral Health Impact Profile (OHIP), IDL weights dimension scores and combines the weighted scores into a single score. The instrument again has good reliability and validity.

There was a 1.7:1 male to female ratio for the sample of tooth wear patients recruited from those referred to a tooth wear clinic. This higher male ratio had previously been reported by Burnett²³ and Milosevic et al²⁴ and may reflect changing referral patterns or represent a lifestyle difference between genders.

Table 6. Comparison of satisfaction scores and personality traits between groups {ANOVA}

		<i>Sum of Squares</i>	<i>df</i>	<i>Mean Square</i>	<i>F</i>	<i>Sig.</i>
N	Between Groups	332.820	1	332.820	4.854	.029
	Within Groups	13575.960	198	68.565		
	Total	13908.780	199			
E	Between Groups	204.020	1	204.020	5.787	.017
	Within Groups	6980.700	198	35.256		
	Total	7184.720	199			
O	Between Groups	297.680	1	297.680	7.462	.007
	Within Groups	7898.940	198	39.894		
	Total	8196.620	199			
SAT	Between Groups	14.305	1	14.305	118.063	.000
	Within Groups	23.990	198	.121		
	Total	38.295	199			
APP	Between Groups	93.845	1	93.845	194.142	.000
	Within Groups	95.710	198	.483		
	Total	189.555	199			
PAIN	Between Groups	6.845	1	6.845	13.549	.000
	Within Groups	100.030	198	.505		
	Total	106.875	199			
COMFORT	Between Groups	8.000	1	8.000	18.966	.000
	Within Groups	83.520	198	.422		
	Total	91.520	199			
G_PER	Between Groups	5.780	1	5.780	14.725	.000
	Within Groups	77.720	198	.393		
	Total	83.500	199			
EATING	Between Groups	16.245	1	16.245	29.918	.000
	Within Groups	107.510	198	.543		
	Total	123.755	199			

SAT= Total satisfaction, APP= Appearance, G_PER= General Performance.

N= Neuroticism, E= Extraversion, O= Openness.

Cases exhibited different types of wear reflecting the multifactorial aetiology of the problem. Parafunction, gastrointestinal problems and diet were found to be the most common aetiologies. The multifactorial nature of wear reported here supports that of other workers^{13,14,21,22}.

Thirty eight percent of tooth wear patients were dissatisfied with their teeth compared to only 4% of controls. Dissatisfaction was not correlated to the severity of tooth wear. This contrasts to Hemmings²⁵ finding that wear had a negative impact on function and aesthetics.

Among the personal factors (age, gender and education) in tooth wear patients only age affected satisfaction with the dentition (eating). As dissatisfaction was not correlated to the severity of wear, this may be as a result of other factors such as socioeconomic considerations. Economics has some impact on patients' satisfaction with their dental condition, the less the economic obstacles to dental treatment, the higher the dental satisfaction²⁶. Weinstein²⁷,

however, showed that age was not associated with higher dissatisfaction although the subjects studied were not in a tooth wear cohort.

When psychological dimensions are considered in relation to dissatisfaction with the dentition high Neuroticism and Conscientiousness and low Extraversion scores were found in the tooth wear subjects. Personality traits thus seem to be related to the levels of satisfaction more than does the severity of the tooth wear. Personality and tooth wear studies have not been widely reported in the literature. Some studies have looked at stress in relation to bruxism²⁸ but not the psychological profiles of patients.

In comparison to controls, tooth wear patients were found to have higher levels of dissatisfaction with appearance, pain, oral comfort, general performance, chewing, eating and their dentition in general. They also have different scores for certain personality traits. Patients with tooth wear scored higher for Neuroticism, lower for Extraversion and

Openness. Neuroticism was associated with total satisfaction in both tooth wear patients and controls.

The results of this study suggest that personality factors impact more on patients' perceptions of their dentitions than personal factors such as age, gender and education. This may in turn have an influence on decisions and outcomes relating to restoration of the worn dentition.

CONCLUSION

Tooth wear impacts on satisfaction with different aspects of the dentition such as appearance, pain, oral comfort, general performance, and eating capacity. This in turn will affect the quality of life and the dental perceptions of patients. Personality traits might play a certain role in determining the satisfaction with the dentition in tooth wear patients and this might explain the results obtained in this study.

Personal factors (age, sex, and education) and tooth wear severity were found to be less important than personality profiles and traits in determining tooth wear patients' satisfaction with their dentition.

In tooth wear patients, high Neuroticism, low Extraversion, and high Conscientiousness scores were associated with lower levels of satisfaction with the dentition

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REFERENCES

1. Strauss RP, Hunt RJ. Understanding the value of teeth to older adults: influences on the quality of life. *J Am Dent Assoc* 1993; **124**(1): 105-110.
2. Leao A, Sheiham A. Relation between clinical dental status and subjective impacts on daily living. *J Dent Res* 1995; **74**(7): 1408-13.
3. Locker D, Slade G. Oral health and the quality of life among older adults: the oral health impact profile. *J Can Dent Assoc* 1993; **59**(10): 830-8, 844.
4. Cushing AM, Sheiham A, Maizels J. Developing socio-dental indicators--the social impact of dental disease. *Community Dent Health* 1986; **3**(1): 3-17.
5. Dong H, Bogg L, Rehnberg C, Diwan V. Health financing policies. Providers' opinions and prescribing behavior in rural China. *Int J Technol Assess Health Care* 1999; **15**(4): 686-698.
6. Mehra T, Nanda RS, Sinha PK. Orthodontists' assessment and management of patient compliance. *Angle Orthod* 1998; **68**(2): 115-122.
7. Lloyd PM. Complete-denture therapy for the geriatric patient. *Dent Clin North Am* 1996; **40**(1): 239-254.
8. Freeman HL. Quantifying quality. *Neuroendocrinol Lett* 1999; **20**(5): 263.
9. Al Quran FA. Factors influencing the acceptance of complete dentures. *PhD Thesis*, Belfast: Queen's University Belfast 1999.
10. Lahti S, Tuutti H, Hausen H, Kaariainen R. Dentist and patient opinions about the ideal dentist and patient-- developing a compact questionnaire. *Community Dent Oral Epidemiol* 1992; **20**(4): 229-234.
11. Harle TJ, Anderson JD. Patient satisfaction with implant-supported prostheses. *Int J Prosthodont* 1993; **6**(2): 153-162.
12. Davis LG, Ashworth PD, Spriggs LS. Psychological effects of aesthetic dental treatment. *J Dent* 1998; **26**: 547-554.
13. El-Swiah JM. An investigation of aspects of tooth wear in selected populations. *PhD Thesis*, Belfast: Queen's University Belfast 2001.
14. Carlsson GE, Johansson A, Lundqvist S. Occlusal wear. A follow-up study of 18 subjects with extensively worn dentitions. *Acta Odontol Scand* 1985; **43**(2): 83-90.
15. Leao A. The development of measures of dental impacts on daily living. *PhD thesis*. London University. 1993.
16. Costa PT, Jr., McCrae RR. Revised NEO Personality Inventory (NEO PI-R) and NEO Five-Factor Inventory (NEO-FFI) Professional Manual. USA: PAR Psychological Assessment Resources Inc. 1992.
17. Costa PT, Jr., McCrae RR. Personality in adulthood: a six-year longitudinal study of self-reports and spouse ratings on the NEO Personality Inventory. *J Pers Soc Psychol* 1988; **54**(5): 853-863.
18. McCrae RR, Costa PT, Jr. Rotation to maximize the construct validity of factors in the NEO Personality Inventory. *Multivariate Behav Res* 1989; **24**: 107-124.
19. Saucier G. Replicable item-cluster subcomponents in the NEO Five-Factor Inventory. *J Pers Assess* 1998; **70**(2): 263-276.
20. AL-Omiri MK. Tooth wear impact on daily living. *PhD Thesis*, Belfast: Queen's University Belfast 2002.
21. Kelleher M, Bishop K. Tooth surface loss: An overview. *Br Dent J* 1999; **186**(2): 61-66.
22. Kidd EAM, Smith BGN. Tooth wear histories: a sensitive issue. *Dent Update* 1993; **20**: 174-178.
23. Burnett CA, Hussey DL, Clifford TJ. Presentation, diagnosis and initial management of patients referred to a hospital tooth wear clinic. *Eur J Prosthodont. Rest. Dent.*, 2001; **9**(1): 5-7.
24. Milosevic A, Young PJ, Lennon MA. The prevalence of tooth wear in 14-year-old school children in Liverpool. *Community Dent Health* 1994; **11**: 83-86.
25. Hemmings KW, Howlett JA, Woodley NJ, Griffiths BM. Partial dentures for patients with advanced tooth wear. *Dental Update*. 1995; **22**(2): 52-59.
26. Tuominen R, Tuominen M. Satisfaction with dental care among elderly Finnish men. *Community Dent Oral Epidemiol*. 1998; **26**(2): 95-100.
27. Weinstein M, Schuchman J, Lieberman J, Rosen P. Age and denture experience as determinants in patient denture satisfaction. *J Prosthet Dent*. 1998; **59**(3): 327-329.
28. da Silva AM, Oakley DA, Hemmings KW, Newman HN, Watkins S. Psychosocial factors and tooth wear with a significant component of attrition. *Eur J Prosthodont Rest Dent*. 1997; **5**(2): 51-55.