

Assessment of Dental Caries, Periodontal Status, and Personality Trait among Population of Dehradun, Uttarakhand, India

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ABSTRACT

Aim and objective: Assessment of dental caries, periodontitis, and personality trait among population of Dehradun.

Materials and methods: This survey was conducted on 480 subjects age ranged 34–45 years of both genders (males—250, females—230). Decayed Missing, Filled Teeth (DMFT) index, periodontal status, and personality trait were recorded.

Results: Age group 34–39 years is comprised of 130 males and 140 females and 40–45 years had 120 males and 90 females. Maximum males (120) were laborer and females were housewife (160). Commonly used method of oral hygiene practice was tooth powder by 80 males and 103 females. Maximum subjects of extroversion (180) was seen in age group 40–45 years, maximum females (110) were housewife with extroversion trait, maximum extroversion trait subjects were using tooth powder (113) and datum (100). Mean DMFT score in subjects was 2.52 and community periodontal index of treatment needs (CPITN) score was 3.41. There were 310 extroversion subjects, 120 neuroticism subjects, and 50 combinations of both extroversion and neuroticism. There was a significant difference in mean missing teeth and DMFT in subjects with different personality traits ($p < 0.05$). The *post hoc* test showed that mean missing teeth between group E and group E + N was found to be statistically significant ($p < 0.05$). The *post hoc* test showed that the mean sextant value for score 2 between group E vs N found to be statistically significant ($p < 0.05$). Neurotic individuals were found to have poorer periodontal health as compared to extroverts.

Conclusion: Authors found that personality trait such as psychological factors have greater impact on status of dental caries and periodontitis. Extroverts had less dental caries and better periodontal status when compared to other personality traits.

Clinical significance: Psychological factors have a great impact on status of dental caries and periodontitis. By assessing various psychological factors, the occurrence of both can be avoided. Thus by improving oral health, overall health of an individual can be improved.

Keywords: Dental caries, Extroverts, Periodontitis, Psychological.

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INTRODUCTION

Dental caries and periodontal diseases are common dental diseases among all age groups.¹ Dental caries is an irreversible microbial disease of the dental tissue characterized by demineralization of the inorganic portion and destruction of the organic portion of teeth.^{2,3} Periodontal diseases are characterized by destruction of periodontal tissues, leading to tooth mobility and ultimate exfoliation of teeth.⁴ In the last few years, there has been declines in dental caries pattern because of recent treatment modalities available; however, untreated dental caries is still being regarded as a more prevalent disease worldwide.⁵ On the other side, the occurrence of periodontal disease remains static in different population groups. The association between dental caries and periodontal diseases has not been well studied so far.⁶

Psychological parameters are implicated in various disease processes.⁷ Manhold and Rosenberg evaluated the correlation between dental disorders and psychological factors.⁸ Personality is one of the psychological factors which appear to affect the oral health.⁹ It has been found that there is variation in oral health status of people with specific personality behavior.¹⁰ Research into the association between personality and oral health has shown at least three processes which can explain the biological association between the two.¹¹ These are neuroticism, extraversion, and

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psychoticism traits which are related to aggressiveness, poor self-control, and increase stress.

It has been established that people who score more on the trait of aggressiveness tend to have bruxism and temporomandibular diseases, such as temporomandibular joint (TMJ) dysfunction.¹¹ Similarly, people who have poor self-control tend to smoke more and likely to develop periodontal diseases and oral cancer.^{12,13} Considering this, the present study established for correlation of dental caries, periodontal status, and personality trait among population of Dehradun.

MATERIALS AND METHODS

This survey was conducted in the Department of Dentistry Uttaranchal Dental and Medical Research Institute, Dehradun. It consisted of 480 outpatient's age ranged 34–45 years of both genders (males—250, females—230). Collection of participants was established on simple random sampling. This study was accepted by institutional ethics committee. All subjects were well informed regarding the usefulness of the study and their written consent was taken.

Inclusion criteria were medically fit subject, those who gave their consent, subjects with at least 24 permanent teeth, and subjects within specified age groups. Exclusion criteria were subjects on antiseptic mouthwash, on antibiotics in the last 2 weeks, and on pregnant patients.

Data, such as name, age, and gender, were recorded. A self-administered open-ended questionnaire ($n = 14$) in Hindi which was distributed among subjects and information related to oral hygiene practices, socioeconomic status (SES), education, occupation, and diet habits, oral hygiene practices were recorded.

A thorough oral examination was performed using probe, mirror, explorer, tweezer, and a periodontal probe. Single evaluator assessed oral cavity in all subjects. Decayed Missing, Filled Teeth (DMFT) index, which indicates decayed–missing–filled teeth were recorded. Total score was added for each subject. Periodontal status was recorded with community periodontal index (CPI). Periodontal status was recorded as code 0, 1, 2, 3, and 4 after examination of the four sites (labial, lingual/palatal, mesial, and distal) in each sextant. The mean score for each subject was considered.

Personality trait was recorded with Eysenck Personality Questionnaire (EPQ) Revised-Short Form (EPQR-S)—Hindi edition (EPQRS-H).

EPQRS-H is a Hindi edition of EPQR-S containing 48 items. Neuroticism, extraversion, and psychoticism traits comprise 12 items each and 12 items are in the lie scale. There was maximum score of 12 and minimum score of 0. Respondents had to respond either “yes” or “no” which was scored as 1 or 0, respectively.

Statistical Analysis

Results thus obtained were tabulated entered into the Microsoft Office Excel 2019 sheet and were assessed IBM SPSS version 19.0. Kruskal–Wallis ANOVA and *post hoc* test were used to compare DMFT, periodontal status, and personality traits at significance of 0.05.

RESULTS

Age group 34–39 years is comprised of 130 males and 140 females and 40–45 years had 120 males and 90 females (Table 1).

Maximum males (120) were laborer and females were housewife (160). Commonly used method of oral hygiene practice was tooth

Table 1: Demographic data of patients

Variable	Male	Female
Age group (years)		
34–39	130	140
40–45	120	90
Total	250	230
Occupation		
Laborer	120	40
Businessman	80	10
Teacher	50	20
Housewife	0	160
Oral hygiene practices		
Toothbrush/toothpaste	70	60
Tooth powder	80	103
Datum	75	55
Mouthwash	25	12
Variable	Mean	
DMFT	2.52	
CPITN score	3.41	

Table 2: Demographic profile and personality trait

Variable	Extroversion (E)	Neuroticism (N)	E + N
Age group (years)			
34–39	130	40	20
40–45	180	80	30
Gender			
Male	170	55	25
Female	140	65	25
Occupation			
Laborer	100	40	20
Businessman	60	20	10
Teacher	40	20	10
Housewife	110	40	10
Oral hygiene practices			
Toothbrush/toothpaste	80	30	20
Tooth powder	113	60	10
Datum	100	20	10
Mouthwash	17	10	10

powder by 80 males and 103 females. Other methods were use of toothbrush/toothpaste in 70 males and 60 females, datum in 75 males and 55 females, and mouthwash in 25 males and 12 females. Mean DMFT score in subjects was 2.52 and Community periodontal index of treatment needs (CPITN) score was 3.41 (Table 1).

Maximum subjects of extroversion (180) was seen in age group 40–45 years, maximum males (170) and females (140) were extroversion, maximum females (110) were house wife with extroversion trait, maximum extroversion trait subjects were using tooth powder (113) and datum (100) (Table 2).

There were 310 extroversion subjects, 120 neuroticism subjects, and 50 combinations of both extroversion and neuroticism. They were classified based on the response of the questionnaire.

There was a significant difference in mean missing teeth in subjects with different personality traits. Similarly, a significant

Table 3: Dental caries experience of individuals with different personality traits

		Number	Mean	p value
Decayed teeth	Extroversion (E)	310	0.85	0.621
	Neuroticism (N)	120	1.30	
	E + N	50	0.54	
Missing teeth	Extroversion (E)	310	0.87	0.01
	Neuroticism (N)	120	1.31	
	E + N	50	2.15	
Filled teeth	Extroversion (E)	310	0.20	0.772
	Neuroticism (N)	120	0.19	
	E + N	50	0.17	
DMFT	Extroversion (E)	310	1.92	0.05
	Neuroticism (N)	120	2.80	
	E + N	50	2.86	
Inter-group comparison				
Missing teeth	E vs E + N			0.001
DMFT	E vs N			0.05

Statistical analysis: Kruskal–Wallis ANOVA and *post hoc* test

Table 4: Periodontal health status of individuals with different personality traits

CPI score		Number	Mean	p value
Score 0	Extroversion (E)	310	3.12	0.05
	Neuroticism (N)	120	2.41	
	E + N	50	3.02	
Score 1	Extroversion (E)	310	0.31	0.04
	Neuroticism (N)	120	0.38	
	E + N	50	0.00	
Score 2	Extroversion (E)	310	2.25	0.05
	Neuroticism (N)	120	2.80	
	E + N	50	2.60	
Score 3	Extroversion (E)	310	0.08	0.217
	Neuroticism (N)	120	0.18	
	E + N	50	0.40	
Inter-group comparison				
Score 0	E vs N			0.001
	N vs E + N			0.02
Score 1	E vs E + N			0.05
	N vs E + N			0.04
Score 2	E vs N			0.001

Statistical analysis: Kruskal–Wallis ANOVA and *post hoc* test

difference was obtained in mean DMFT score in subjects with different personality traits ($p < 0.05$). The *post hoc* test for dental caries experience of individuals with different personality traits showed that mean missing teeth between group E and group E + N was found to be statistically significant ($p < 0.05$) (Table 3).

The combination of extroversion and neuroticism had higher missing score compared to extroversion and neuroticism alone. Table 4 shows that there was a significant difference in mean sextant value for score 0, 1, and 2 in CPI among E, N, and E + N groups in subjects with different personality traits ($p < 0.05$). The *post hoc* test for periodontal health status of individuals with different personality traits showed that the mean sextant value for score 2

between group E vs N found to be statistically significant ($p < 0.05$). Neurotic individuals were found to have poorer periodontal health as compared to extroverts (Table 4).

DISCUSSION

Dental caries and periodontal diseases are more prevalent among subjects. DMFT score is indicative of awareness about oral health.¹⁴ Community periodontal index states the periodontal status of teeth. Both DMFT and CPI indices are widely used and acceptable methods. There are various measures to evaluate an individual's personality.¹² Eysenck Personality Questionnaire (EPQ) Revised-Short Form (EPQR-S) measures three personality traits, such as extroversion, neuroticism, and psychoticism.¹⁵ Characters, such as impulsivity, sociality, neuroticism dimension with emotional instability and reactivity, were associated with extroversion dimension. Distant, cold, insensitive, absurd, and unable to empathize with others type of personality characteristics were indicates psychoticism dimension. In this study, we established correlation of dental caries, periodontitis, and personality trait among the study group of Dehradun.

Personality traits reproduce the behavior of a person, thereby delivering evidence to the psychosomatic origin of diseases. Dental caries and periodontal disease do have complex etiology which is multifactorial, including some modifiable risk factors and some non-modifiable risk factors. It was found from our study that there was a strong involvement between negative emotionality and caries-associated tooth loss which is similar to the results of other studies.⁵

In the present study, we found that maximum subjects of extroversion (180) was seen in age group 40–45 years, maximum males (170) and females (140) were extroversion, maximum females (110) were housewife with extroversion trait, maximum extroversion trait subjects were using tooth powder (113) and datum (100). In this study, we found that maximum males and females were extroverts.

We included 480 subjects with 310 extroversion subjects, 120 neuroticism subjects, and 50 combinations of both extroversion and neuroticism. We observed that mean DMFT score in subjects was 2.52 and CPITN score was 3.41.

Gupta and Shetty conducted a study on 450 adults, aged 35–44 years. They found 282 extroverts, 76 neurotics and 17 mixture of extroversion and neuroticism, and 3 (0.7%) were an amalgamation of extroversion and psychoticism. It was found that dental caries and periodontal disease were significantly less in extroverts in comparison to other personality traits.¹⁶

We observed that 33.3% laborers and 33.3% housewife had neurotic personality trait. Thus, we can state that higher work load as in laborer and housewife has negative impact on oral health.

We found that there was a significant difference in mean missing teeth and DMFT score in subjects with different personality traits. It was found that the combination of extroversion and neuroticism had higher missing score. Extroverts had less dental caries when compared to other personality traits. There was a significant difference in mean sextant value for score 0, 1, and 2 in CPI among E, N, and E + N groups in subjects with different personality traits. The mean sextant value for score 2 between group E vs N found to be statistically significant. Neurotic individuals were found to have poorer periodontal health as compared to extroverts. Extroverts had better periodontal status when compared to other personality traits.

Yavagal and Singla in their survey used Jenkins Activity Survey Questionnaire to determine the personality types and dental caries

pattern. A personality questionnaire used and assessed traits as type I, type II, and type AB. It was observed that the occurrence of dental caries was 96.6% in type I personality and 95.9% in type II personality and this variance was not statistically important.¹⁷

Takeshita et al. assessed oral health-related quality of life (OHRQoL) in 938 subjects aged 69–71 years with Geriatric Oral Health Assessment Index (GOHAI). It was found that neuroticism was negatively associated with the GOHAI score in bivariate analyses, whereas extraversion was positively associated with the regression analyses, neuroticism and extraversion were significantly related to the GOHAI scores.¹⁸ We found association of psychological factors with dental diseases. Neuroticism is a predictor of the quality of one's life. Personality-related traits can result into superior neuroticism, inferior extraversion, and extended negative mood.¹⁹

Zaitso et al.²⁰ in their study found that factors significantly associated with severe periodontal disease were employment with a company with fewer than 50 employees and not brushing teeth before bedtime. The factors significantly associated with having 23 teeth or fewer were subjects in the education and learning support industry compared with manufacturing industry (OR = 5.83) and transport industry (OR = 12.01). The results showed that various occupational parameters and health behaviors are associated with oral health status including tooth decay, periodontal disease, and tooth loss.

Limitation of the study is a lengthy questionnaire (Eysenck's questionnaire) which was one of the limiting factors. Subjects were motivated again and again to respond carefully. Larger scale studies may be helpful to assess the correlation of dental status, periodontal status, and psychological factors.

CONCLUSION

The authors found that personality trait such as psychological factors have a great impact on status of dental caries and periodontitis. In daily practice by assessing the personality of the patients, the cause of dental caries and periodontitis may be linked. We found that extroverts had less dental caries and better periodontal status when compared to other personality traits.

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