



Oral Health Status of Mothers According to Different Personality Traits and Influence on their Child's Oral Health: A Cross-sectional Survey

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ABSTRACT

Objective: Oral hygiene practices vary as per different personalities. The objective of this study was to evaluate the oral health status of mothers of various personality traits and its influence on their child's oral health.

Materials and methods: The present study was a cross-sectional survey conducted among 450 mothers of 20–40 years having child of 3–7 years. "Eysenck Personality Questionnaire" was given to all the mothers to classify them into four different personality traits, i.e., Extroversion, Neuroticism, Lie scale, and Psychoticism; followed by an assessment of oral health status of both mothers and their child. Collected data were compiled in MS-Excel sheet and subjected to statistical analysis.

Results: Results were statistically analyzed with the analysis of variance (ANOVA). For pairwise intergroup multiple comparisons, *post hoc* Tukey test was applied. Association of child's oral health status with mother's oral health with respect to four different personality traits was done by linear regression analysis. From the present study it was seen that severity of dental caries status was more in psychoticism group as compared to other personality groups ($p < 0.05$) for mothers as well as children. Simplified Oral Hygiene Index (OHI-S) was seen to be statistically significant with highest mean in Lie scale group.

Conclusion: From the present study, it was concluded that there is a positive correlation with mother's personality traits and oral health status of mothers and their children.

Keywords: Cross-sectional study, Eysenck Personality Questionnaire, Personality traits.

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INTRODUCTION

A number of psychological tests have been premeditated to examine patients in terms of their personality attributes.¹ Different personality tests can be used to assess individual differences. Available literature is suggestive of improvement in oral hygiene and oral hygiene related behaviors.²

When subjected to prolonged physical or emotional stress results in delayed wound healing and increased vulnerability to systemic diseases. Higher prevalence of gingival diseases in young and adults is the burning concern nowadays.³ Gingivitis followed by destructive periodontal diseases eventually leading to loss of tooth is known to be precipitated by variety of determinants.⁴ Oldsters especially mothers influence their children's health is a widely accepted thought.⁵ Likewise it is also linked with oral health since they are the first caregivers of oral health to their youngsters throughout the primary 3 years of life and even later. Hence, the factors like maternal education, occupation, age, current knowledge, attitude, and behavior must be having a greater impact on their health habits and their children's health indirectly.⁶ It has been seen that there is a constant relationship between dental health of mothers and dental caries in their children which can be explained by the influence of faulty dietary and hygiene habits on infants can make the child as well as mother susceptible to dental caries.^{7,8} Dental care professionals acknowledge that efforts aimed at improving parental oral health behavior could result in reduction in caries risk among their children.⁷ However, there is scarcity of literature to confirm this connection.

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Unfortunately, so many children suffer from dental caries at a very early age.⁹ Those affected often have a decreased oral health related quality of life as compared to that of caries free counterparts.^{10–12} There has been an insufficient research available on the impact of overall personality of an individual on their oral

hygiene condition. Hence, the aim of the present study is to examine oral health status of mothers according to different personality traits and its effect on their child's oral health.

MATERIALS AND METHODS

The present study was a cross-sectional descriptive study. Study population comprised of 450 mothers of 20–40 years of age and their children of 3–7 years age group carried over a period of 2 months. Prior to the start of the present study, a well-defined protocol was submitted to the Institutional Ethical Review Board and ethical clearance was obtained. Samples were collected from four different schools of a city by obtaining permission from the concerned authorities after explaining the purpose and protocol of the study. Schedule for the oral health education and examination was prepared well in advance.

The study samples were taken by dividing a city into four zones. From each zone one school was selected randomly from where total of 450 mothers were selected based on inclusion and exclusion criteria. Prior to the start of the study, list of various preprimary schools were obtained. Simple cluster random sampling method was used for collecting samples from the cluster of a school.

A sample size has been estimated to be 450 which is derived by the formula

$$[n = 4pq/l^2]^3$$

Inclusion criteria: Mothers and their children aged 20–40 years and 3–7 years old age group, respectively and subjects willing to participate in the present study.

Exclusion criteria: Whereas subjects who filled questionnaires incompletely, not willing to give their consent for the present study, those who were suffering from any systemic disease, on any medications/therapy for any other chronic disease, having any adverse habit like tobacco chewing, smoking, etc., and those who had underwent any periodontal therapy in the last 6 months.

A specially prepared and pretested Performa, designed for collecting all the required and relevant information pertaining to the study was used. The Performa also included Revised Eysenck Personality Questionnaire (EPQR-A),^{13,14} as well as various indices to assess caries and oral hygiene status. Dentition Status Index,¹⁵ Patient Hygiene Performance Index,^{16,17} and Gingival Index^{16,18} were taken to assess the oral health of mothers whereas for children the indices used were Dentition Status Index (primary and permanent dentition)¹⁹ and Simplified Oral Hygiene Index (OHI-S) (deciduous and mixed dentition).^{16,20}

Intraoral examination was conducted using standard infection control protocol by principal investigator who was trained and calibrated to assess oral hygiene at the Department of Public Health Dentistry of a Dental Institute.

To determine intraexaminer variability, the questionnaires were given to 25 randomly selected mothers followed by oral health checkup and their 3–7 years old children. The results were subjected to Kappa statistics. Kappa coefficient for EPQR-A was 0.84 whereas intraexaminer correlation coefficient was 0.99, 0.99, 0.998, 1, and 0.83, respectively for dentition status mothers, patient hygiene performance index (PHP, gingival index (GI), dentition status children, and OHI-S.

Eysenck Personality Questionnaire was translated in regional language (Marathi) and later back translated to English.

The personality characters were assessed by using an abbreviated form of the EPQR-A. Revised Eysenck Personality Questionnaire is self-reported questionnaire each question has

binary response—"yes", "no". Each dichotomous item was scored maximum "1" and minimum "0" possible score.

Revised Eysenck Personality Questionnaire includes 24 items and four subscales:

Extroversion (E-6 items), Neuroticism (N-6 items), Psychoticism (P-6 items), and Lie scale (L-6 items).

As an individual can have more than one personality trait, based on this model, the subjects who scored above average expressed greater forte of that particular factor and to be considered into that personality trait. Accordingly, subjects were divided into four groups: "P, E, N, and L", respectively.

The Scoring Key for EPQR-A

For items 3, 5, 7, 10, 15, 16, 17, 19, 20, and 22, Yes = 0, No = 1 points. For items 1, 2, 4, 6, 8, 9, 11, 12, 13, 14, 18, 21, 23, and 24, Yes = 1, No = 0 points.

Neuroticism scale (1, 9, 11, 14, 18, 21)

Extroversion scale (2, 4, 13, 15, 20, 23)

Psychoticism scale (3, 6, 8, 12, 16, 22)

Lie scale (5, 7, 10, 17, 19, 24).^{13,14}

Data were entered and analyzed using SPSS version 20 (IBM Corporation, Armonk, NY, USA). Results were statistically analyzed with the ANOVA. For pairwise intergroup multiple comparisons, *post hoc* Tukey test was applied. Association of child's oral health status with mother's oral health with respect to four different personality traits was done by linear regression analysis and $p < 0.05$ was considered as statistically significant.

RESULTS

In the present study, a total of 330 filled questionnaires were analyzed and 100% response rate was seen.

One way ANOVA test showed statistically significant difference for scores 0, 1, 3, and 4. For score 0 (sound teeth), highest mean value was seen for Neuroticism trait. Psychoticism was showing highest mean for scores 1, 3, and 4 ($p < 0.05$) (Table 1). Extroversion showed highest mean value for score 2 (one way ANOVA test) ($p < 0.05$) (Table 2). One way ANOVA test showed statistically no significant difference ($p > 0.05$) (Fig. 1). Statistically significant difference for score 1 (caries). For score 1, Psychoticism showed the highest mean ($p < 0.05$) (Fig. 2). When linear regression analysis test was applied to check an association child's oral health status with mother's oral health (overall), for 1 unit increase in mother's caries score, a 0.305 unit increase in caries in child's deciduous teeth is predicted, holding all other variables constant. For 1 unit increase in mother's caries score, a 0.006 unit increase in caries in child's permanent teeth is predicted, holding all other variables constant. For 1 unit increase in mother's missing teeth score, a 0.079 unit increase in missing teeth in child's deciduous teeth is predicted, holding all other variables constant. It was seen to be statistically significant for caries of deciduous dentition ($p < 0.05$) (Table 3). On application of one way ANOVA test statistically significant difference was found with maximum mean in Psychoticism scale (F value—6.830) ($p < 0.05$) (Fig. 3).

DISCUSSION

Systemic health and subsequently an oral health are dependent on one's personality. Studies have shown the various effects of personality traits on oral health and health-related behaviors.^{21,22}

Table 1: Comparison of oral health status (crown) of mothers based on personality traits

Oral health status score	Personality traits	N	Mean	Std. deviation	95% confidence interval for mean		F-value	p-value
					Lower bound	Upper bound		
Score 0 (sound teeth)	Neuroticism	151	29.22	2.835	28.76	29.67	6.797	0.001*
	Extroversion	189	28.99	2.599	28.62	29.36		
	Psychoticism	33	26.91	2.983	25.85	27.97		
	Lie scale	77	29.08	2.599	28.49	29.67		
Score 1 (caries)	Neuroticism	151	1.83	2.359	1.46	2.21	3.412	0.017*
	Extroversion	189	1.91	2.170	1.60	2.22		
	Psychoticism	33	3.06	2.091	2.32	3.80		
	Lie scale	77	1.66	1.924	1.23	2.10		
Score 2 (filled with caries)	Neuroticism	151	0.07	0.298	0.02	0.11	1.540	0.203
	Extroversion	189	0.13	0.504	0.06	0.20		
	Psychoticism	33	0.24	0.751	-0.02	0.51		
	Lie scale	77	0.14	0.479	0.03	0.25		
Score 3 (filled without caries)	Neuroticism	151	0.10	0.458	0.03	0.17	2.551	0.050*
	Extroversion	189	0.05	0.305	0.01	0.10		
	Psychoticism	33	0.27	0.801	-0.01	0.56		
	Lie scale	77	0.10	0.383	0.02	0.19		
Score 4 (missing for caries)	Neuroticism	151	0.24	0.746	0.12	0.36	5.029	0.002*
	Extroversion	189	0.33	0.856	0.21	0.45		
	Psychoticism	33	0.82	1.211	0.39	1.25		
	Lie scale	77	0.53	0.995	0.31	0.76		
Score 5 (missing for other reason)	Neuroticism	151	0.09	0.422	0.02	0.16	2.293	0.077
	Extroversion	189	0.06	0.433	0.00	0.13		
	Psychoticism	33	0.24	0.561	0.04	0.44		
	Lie scale	77	0.03	0.228	-0.03	0.08		
Score 6 (fissure sealant)	Neuroticism	151	0.03	0.229	-0.01	0.06	2.572	0.054
	Extroversion	189	0.02	0.125	0.00	0.03		
	Psychoticism	33	0.00	0.000	0.00	0.00		
	Lie scale	77	0.10	0.475	0.00	0.21		
Score 7 (fixed prosthesis)	Neuroticism	151	0.21	1.129	0.03	0.39	0.339	0.797
	Extroversion	189	0.17	0.746	0.06	0.28		
	Psychoticism	33	0.15	0.870	-0.16	0.46		
	Lie scale	77	0.09	0.403	0.00	0.18		
Score 8 (unerupted)	Neuroticism	151	0.18	0.555	0.09	0.27	0.792	0.499
	Extroversion	189	0.25	0.816	0.13	0.37		
	Psychoticism	33	0.18	0.584	-0.03	0.39		
	Lie scale	77	0.12	0.458	0.01	0.22		

One way ANOVA test; *indicates significant at $p \leq 0.05$

Skills and attitudes are determined from your childhood rearing which will create a lifetime impact on the child and very difficult to get changed. Hence, children aged 3–7 and their mothers aged 20–40 years were chosen for the present study. Samples are selected randomly from a different cluster of schools. Therefore, each member of the population has a predetermined probability of being selected independently of all others. It also decreased bias in the study and increased the power of study.¹⁶

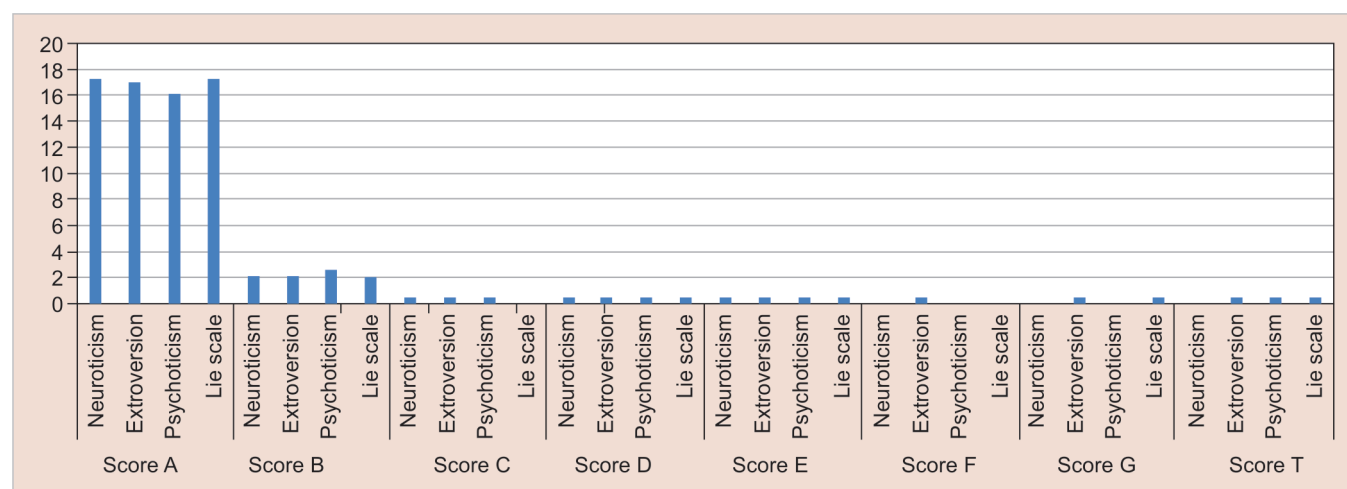
The Eysenck Personality Questionnaire was included in this study to give ready measure of important personality dimensions: Psychoticism (P), Extroversion (E), and Neuroticism (N), along with Lie scale (L). Solitary, troublesome, cruel, lacking in feeling and empathy, hostile to others, sensations lacking, and liking odd and

unusual things is a psychotic personality. People with Neuroticism trait demonstrate general emotional liability, emotional over responsiveness, as well as liability to neurotic breakdown under stress. Extroversion as opposed to introversion refers to the outgoing, uninhibited, social proclivities of a person.²³ Followed by Eysenck Personality Questionnaire, dentition status, PHP, and GI were recorded for mothers whereas dentition status and OHI-S have been recorded for child. This is because in previously conducted studies, studies were showing an association between behavioral patterns with these compared indices.^{24–26} Numerous researchers have proved an interrelationship between parents' beliefs about diet, oral hygiene, and the inevitability of oral disease and their children's oral health²⁶ and also the gingival health of their school going children.²⁵

Table 2: Comparison of oral health status (roots) of mothers based on personality traits

Oral health status score	Personality traits	N	Mean	Std. deviation	95% confidence interval for mean		F-value	p-value
					Lower bound	Upper bound		
Root 0	Neuroticism	151	31.13	1.667	30.86	31.39	2.610	0.051
	Extroversion	189	31.13	1.535	30.91	31.35		
	Psychoticism	33	30.30	2.325	29.48	31.13		
	Lie scale	77	31.08	1.316	30.78	31.38		
Root 1	Neuroticism	151	0.07	0.505	-0.01	0.15	1.260	0.288
	Extroversion	189	0.05	0.533	-0.02	0.13		
	Psychoticism	33	0.24	0.792	-0.04	0.52		
	Lie scale	77	0.10	0.416	0.01	0.20		
Root 2	Neuroticism	151	0.00	0.000	0.00	0.00	12.111	0.001*
	Extroversion	189	0.00	0.000	0.00	0.00		
	Psychoticism	33	0.12	0.415	-0.03	0.27		
	Lie scale	77	0.00	0.000	0.00	0.00		
Root 7	Neuroticism	151	0.21	1.127	0.02	0.39	0.727	0.537
	Extroversion	189	0.16	0.734	0.05	0.26		
	Psychoticism	33	0.00	0.000	0.00	0.00		
	Lie scale	77	0.09	0.403	0.00	0.18		
Root 8	Neuroticism	151	0.17	0.551	0.08	0.26	0.709	0.547
	Extroversion	189	0.23	0.649	0.13	0.32		
	Psychoticism	33	0.18	0.584	-0.03	0.39		
	Lie scale	77	0.12	0.458	0.01	0.22		
Root 9	Neuroticism	151	0.01	0.081	-0.01	0.02	0.659	0.578
	Extroversion	189	0.00	0.000	0.00	0.00		
	Psychoticism	33	0.00	0.000	0.00	0.00		
	Lie scale	77	0.00	0.000	0.00	0.00		

One way ANOVA test; *indicates significant at $p \leq 0.05$


Fig. 1: Dentition status scores for deciduous teeth among children

Ultimately mothers are said to be the caregivers for their child out of both the parents. Therefore, children are maximally influenced by mothers, their behavior pattern and their beliefs, habits, etc.²⁷⁻³⁰ Psychoticism scale people are mostly predisposed to poor oral health whereas the one with Extroversion scale are more likely to smoke resulting in periodontitis as stated by Caspi et al.²⁷ After Psychoticism, comparatively lesser mean was seen with Lie scale group followed by Extroversion and Neuroticism. This is again due to different attitudes of mothers which is ultimately

dependent on their personality trait which will decide their way of following oral hygiene measures for themselves and for their child. One of the studies (Saied-Moallemi et al.) demonstrated a sound dentition of children of mothers with positive attitudes toward oral health. Almost all mothers (90%) were of the opinion that they would be able to prevent dental decay.²⁸

Dental caries of mothers were assessed by DMFT index in the present study. According to the literature, it is assumed that frequency of dental caries is higher in children and young adults

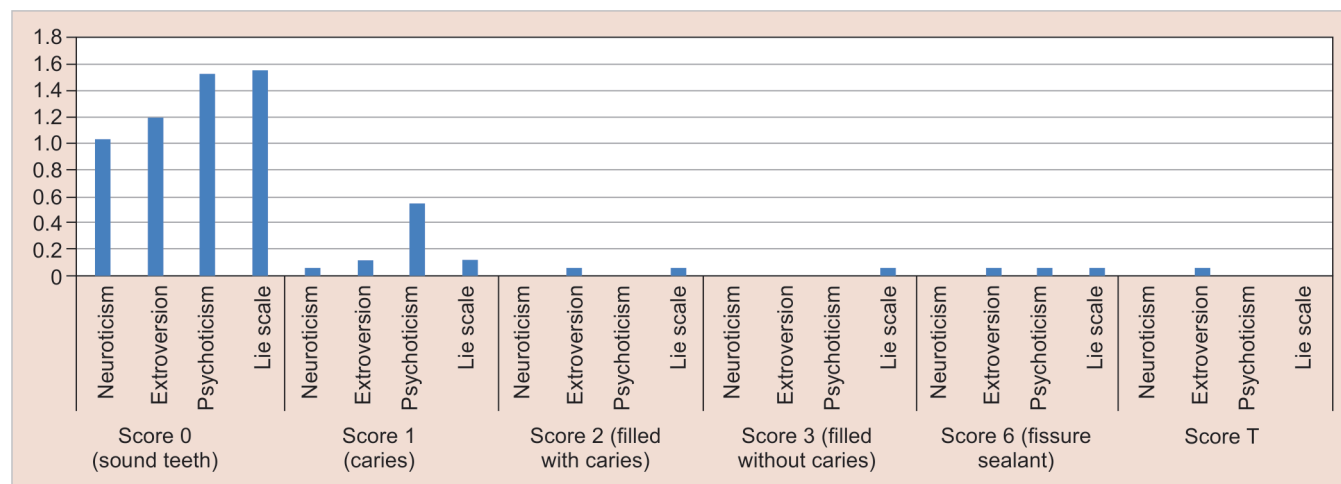


Fig. 2: Dentition status scores for permanent teeth among children

Table 3: Association of child's oral health status with mother's oral health (overall)

Parameter	Unstandardized β value	p-value
Caries for deciduous dentition	0.305	0.001*
Caries for permanent dentition	0.006	0.587
Missing teeth (deciduous)	0.079	0.050

Linear regression analysis; *indicates significant at $p \leq 0.05$

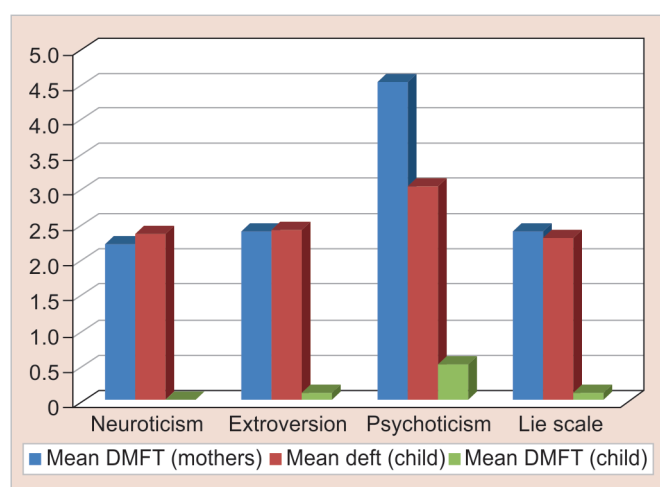


Fig. 3: Comparison of means DMFT scores of mothers and children

whereas it becomes less as age of the person increases.¹⁵ In present study, statistically significant relation was not found between all the four personality traits. But when we see the results comparatively higher mean was seen with Psychoticism followed by Lie scale, Extroversion, and Neuroticism. Again the same pattern of results was found as DMFT scores but there was no statistical significance. This is so because mothers included in our study were of 20–40 years of age with the mean of 28. According to the literature, susceptibility to gingival and periodontal disease increases as age increases.^{31,32} Paulander et al. observed in his study that Psychoticism and Neuroticism scales had clinically moderate gingivitis and Extroversion scales have shown severe gingivitis.³³ When overall results were compared, it was seen that as the personality trait of mother changes, habit of oral hygiene maintenance also changes. Accordingly there is a change in the

oral health status of mothers as well as their children. Further longitudinal studies with regular follow-up intervals need to be done.

CONCLUSION

Four hundred and fifty mothers were divided into four respective personality traits, i.e., Neuroticism, Extroversion, Psychoticism, and Lie scale. Comparison of DMFT scores of mothers with different personality traits showed that mean number of teeth affected were more in Psychoticism trait which showed statistically significant difference. Comparison of DMFT scores of children with respect to different personality traits of their mothers showed that mean number of teeth affected were more in Psychoticism trait which showed statistically significant difference. Comparison of PHP and GI of mothers by different personality traits showed statistically no significant difference. Comparison of OHI-S of children showed statistically significant difference with the highest mean for Lie scale trait.

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