ORIGINAL RESEARCH

Evaluation of Smile Line in Relation to Age among Saudi Population in Asser Region

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ABSTRACT

Introduction: Dentofacial appeal and smile are vital to a person's psychosocial well-being. The 'smile line' is commonly used as a parameter to evaluate and categorize a person's smile. This study was undertaken to determine the parameters for an objective evaluation of smiles and to assess the prevalence of various smile determining parameters in relation to age among Saudi population in Asser region.

Materials and methods: A cross-sectional survey was designed. A total of 162 study samples participated in the study. A pre-designed proforma was used to evaluate malocclusion which consisted—demographic details, smile line, gingival line, incisal line, lower lip to incisal line, buccal corridor, facial midline and dental midline, shade for upper central incisors and shade for upper lateral incisors.

Results: The mean age of study participants were 27.07 ± 9.76 years. Majority of the participant, i.e. 52%, had average smile line and 9.3% had very high smile line. 64.8% of the study participants had normal gingival line. Only 2.5% had over, incisal line whereas 77.2 had normal incisal line. Majority (88.3%) of the participants had normal lower lip to incisal line. 44.4% had small buccal corridor.

Conclusion: There is scientific evidence that a certain smile line/tooth arrangement is the most common parameter which can be applied for treatment planning purposes. These results underline the importance of the smile line when restoring a patient's intraoral harmony. The clinician should aim for these parameters for an esthetic and functional balance.

Keywords: Smile line, Saudi, Prevalence of malocclusion.

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INTRODUCTION

Dentistry has encountered a change from attention on restoration to elective corrective treatment.[1,2] Although dental experts are subjected to the same natural patterns and media viewpoints, instructive encounters may predispose a clinician's esthetic inclination far from those of the general public.[2-4] Clinicians are committed to comprehend excellence, amicability, function, and extent as seen by public opinion when arranging treatment.[2,5] Dentofacial appeal is especially vital to a person's psychosocial well-being.[2,6]

Smiling is a standout amongst the most critical facial expressions and known as a nonverbal parameter of correspondence, communicating joy.[6-8] Furthermore, an appealing smile is portrayed as a paramount apparatus to impact individuals. Overviews have checked that smiling individuals are trusted more than nonsmiling ones.[9] Existing proof has additionally uncovered that facial allure, in which an alluring smile assumes a significant part, impacts voting and choices, work recruitments and other social interactions.[6-10]

The 'smile line' is commonly used as a parameter to evaluate and categorize a person's smile.[11] The concept of smile line has been defined as 'the harmony between the curvature of the incisal edges of the maxillary anterior teeth and the upper border of the lower lip' by Frush and Fisher[12] in 1985 and by Jameson[13] in 2002. The importance of the confluence of the curvatures of the upper border of the lower lip and the incisal edge of the maxillary incisor to obtain an attractive smile has been discussed.[14] An 'average smile' as one that exhibits the full clinical crown of the six maxillary anterior teeth and also the premolars from frontal view. It has been also mentioned that in an average smile the incisal curve of the maxillary teeth should be parallel to the inner curvature of the lower lip.[15]

The upper lip position and curvature, the parallelism of the anterior incisal curve with the lower lip, the relationship between the maxillary anterior teeth and the lower lip, and the number of teeth displayed in the smile are the various characteristics that affects the smile esthetics.[16] Midline diastema has been considered unesthetic by lay people.[17,18]

The facial midline is usually the starting point of the esthetic treatment plan.[19] The location of the facial warrants two anatomical landmarks.[20] The first is the nasion; the second is the base of the philtrum (Cupid's bow), in the

center of the upper lip. A line drawn between these land-marks determines the position of the facial midline as well as the direction of the midline.

In recent years, smile analyses and attempts to include smile aspects into treatment planning have become key to orthodontic treatment success.[21] The present study was attempted to assess maximum attributes of an attractive smile.

MATERIALS AND METHODS

A cross-sectional survey was designed. All study participants reporting to King Khalid University, College of Dentistry, Asser Central Hospital and Civil Hospital for Orthodontic needs were recruited as study samples. A total of 162 study samples participated in the study. Informed consent was taken from all study participants and ethical clearance was obtained from all the institutions.

The following inclusion and exclusion criteria was followed for the recruitment of the participants: Absence of incisal restorations or prosthetic crowns, abrasion, attrition or erosion; gingival retraction; gingival hyperplasia; orthodontic appliance; accentuated facial asymmetry in the superior anterior teeth and no history of facial trauma or plastic surgery in the face.

A predesigned proforma was used to evaluate mal-occlusion which consisted—demographic details, smile line, gingival line, incisal line, lower lip to incisal line, buccal corridor, facial midline and dental midline, shade for upper central incisors and shade for upper lateral incisors. The presence of a discrepancy between the dental and facial midlines was evaluated. The facial midline was located by drawing a line connecting two anatomical landmarks: the point between the eyebrows and the base of the philtrum in the center of upper lip.[33] Type-III clinical examination as recommended by American Dental Association (ADA) specification was followed. All three examiner involved in the study were calibrated and inter examiner reliability was calculated using kappa statistics (kappa value = 0.94).

Statistical Analysis

The data were entered in excel 2010 and were analyzed using statistical package for social sciences 16.0. The frequency and percentage distribution of the study variables among the study participants was calculated. The association of the age with study variables was assed using Chi-square test. p-value less than 0.05 was considered statistically significant.

RESULTS

A total of 162 participants were included in the study with a mean age of 27.07 ± 9.76 years (Graph 1). Table 1 shows the frequency distribution of the study parameters. Majority of

Table 1: Distribution of the study variables within the study participants

| Study variables		Frequency	Percentage(%)
Smile line	Low	19	11.7
	Average	85	52.5
	High	43	26.5
	Very high	15	9.3
	Total	162	100.0
Gingival line	Normal	105	64.8
	Equal	56	34.6
	Over	1	0.6
	Total	162	100.0
Incisal line	Normal	125	77.2
	Equal	33	20.4
	Over	4	2.5
	Total	162	100.0
Lower lip to incisal line	Normal	143	88.3
	Equal	18	11.1
	Over	1	0.6
	Total	162	100.0
Buccal corridor	None	60	37.0
	Small	72	44.4
	Large	30	18.5
	Total	162	100.0
Facial midline and dental midline	Coincide	102	63.0
	Not coincide	60	37.0
	Total	162	100.0
Shade for upper central incisors	A	116	71.2
	B	46	28.2
	C	0	0
	M	1	0.6
	Total	163	100.0
Shade for upper lateral incisors	A	105	64.4
	B	56	34.4
	C	1	0.6
	M	1	0.6
	Total	163	100.0
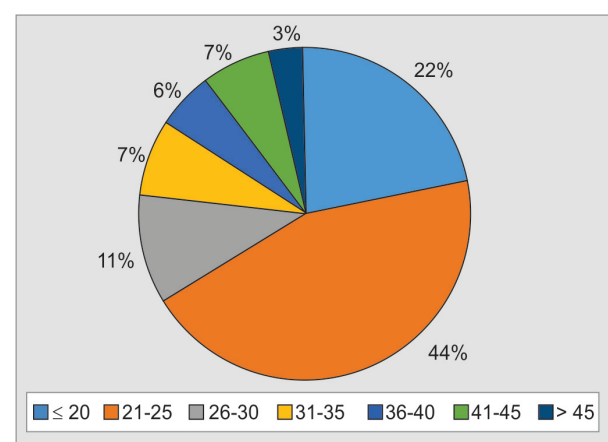
Graph 1: Age-wise distribution of the study population

the participant, i.e. 52%, had average smile line and 9.3% had very high smile line (Graph 2). 64.8% of the study participants had normal gingival line (Graph 2). Only 2.5%

Table 2: Association of study variables with age groups using chi-square test

		Age groups							p-value
		≤20	21-25	26-30	31-35	36-40	41-45	>45	
Smile line	Low	1	7	1	3	2	4	1	0.153
	Average	23	35	10	5	3	5	4	
	High	7	22	6	3	4	1	0	
	Very high	5	8	0	1	0	1	0	
	Total	36	72	17	12	9	11	5	
Gingival line	Normal	26	49	12	5	6	4	3	0.056
	Equal	10	23	5	7	3	6	2	
	Over	0	0	0	0	0	1	0	
	Total	36	72	17	12	9	11	5	
Incisal line	Normal	28	59	12	9	8	7	2	0.414
	Equal	6	12	5	3	1	3	3	
	Over	2	1	0	0	0	1	0	
	Total	36	72	17	12	9	11	5	
Lower lip to incisal line	Normal	31	63	15	11	8	11	4	0.509
	Equal	5	9	1	1	1	0	1	
	Over	0	0	1	0	0	0	0	
	Total	36	72	17	12	9	11	5	
Buccal corridor	None	15	28	5	4	2	5	1	0.903
	Small	16	29	10	5	5	5	2	
	Large	5	15	2	3	2	1	2	
	Total	36	72	17	12	9	11	5	
Facial midline and dental midline	Coincide	21	46	10	8	6	8	3	0.983
	Not coincide	15	26	7	4	3	3	2	
	Total	36	72	17	12	9	11	5	
Shade for upper central incisors	A	25	50	15	8	7	5	6	0.104
	B	11	22	2	3	2	5	1	
	C	0	0	0	0	0	0	0	
	M	0	0	0	1	0	0	0	
	Total	36	72	17	12	9	10	7	
Shade for upper lateral incisors	A	21	46	13	8	6	6	5	0.582
	B	15	25	4	3	3	4	2	
	C	0	1	0	0	0	0	0	
	M	0	0	0	1	0	0	0	
	Total	36	72	17	12	9	10	7	
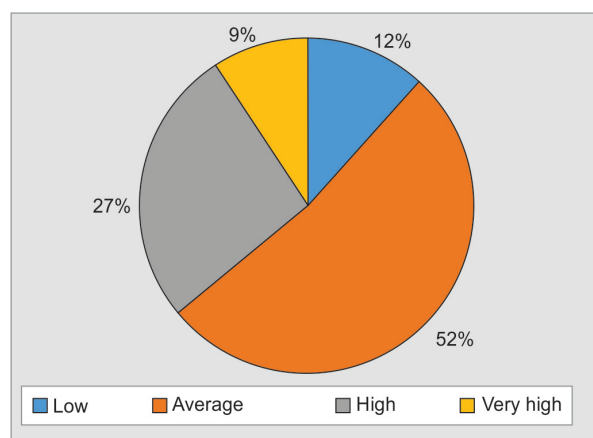
Graph 2: Distribution of the various type of smile lines

had over, incisal line whereas 77.2 had normal incisal line (Graph 2). Majority (88.3%) of the participants had normal lower lip to incisal line. 44.4% had small buccal corridor.

Facial midline and dental midline did coincide in 63% of study population. Shade A was the most common color for the maxillary incisor teeth with 71.2 and 64.4 had A shade for upper central and lateral incisors respectively.

Table 2 shows the association of the study parameters with age of the study participants using Chi-square test. There was no statistically significant association found between age and any of the study parameters.

DISCUSSION

The smile is legitimately esteemed a significant method for nonverbal social correspondence and a sound model of facial engaging quality. Despite the fact that orthodontics is built essential with respect to occlusal connections, more stupendous consideration is currently paid to the facial style impacted by the smile. Since 1950, esthetics in orthodontics

have for the most part been assessed by means of profile pictures because of cephalometrics and the attention on the anteroposterior measurement in malocclusions. Despite the fact that patients regularly look for orthodontia to enhance their smile,[21-23] the literature predominantly emphasizes over on skeletal structures,[21,24-27] which intimates that the smile gets little consideration. Quite a few criteria have been proposed in the literature to improve esthetics. These criteria are pivotal for encouraging the work of the dental practitioner and technician.[21]

Low smile lines are more prevalent in males while high smile lines are more common in females.[15,28,29] Desai et al analyzed the smiles of 261 people and categorized them into five age groups.[30] Their most significant finding was that the height of the smile line changes with age. No subject in the 15 to 19 years age group had a low smile line, while no subject in the 50-and-over age group revealed a high smile line. Dong et al also showed that the amount of maxillary central incisor exposure during smiling decreases with age.[16] However, in our study we did not find any association between age and smile line.

Moore et al[31] also studied the influence of buccal corridors on smile attractiveness with lay persons as judges. They found that broad smiles were rated best, followed by medium-broad ones, medium ones, and medium-narrow ones and narrow smiles were rated least attractive. They concluded that both men and women preferred minimal buccal corridors. A similar study conducted by Dunn et al[32] also corroborated these findings.

Whenever possible, the midline between the maxillary central incisors should coincide with the facial midline. In cases in which this is not possible, the midline between the central incisors should be parallel to the facial midline. But as light deviation to the right or left is still acceptable. Harmony between dentofacial characteristics should be emphasized.[2,33-35]

CONCLUSION

There is scientific evidence that a certain smile line/tooth arrangement is the most common parameter which can be applied for treatment planning purposes. These results underline the importance of the smile line when restoring a patient's intraoral harmony. The clinician should aim for these parameters for an esthetic and functional balance.

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