

The prevalence of facial and dentolabial parameters among students of the Faculty of Dentistry of Lithuanian University of Health Sciences

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SUMMARY

Objective. Nowadays esthetic checklist is an indispensable assistance for the dental clinics. Processing the information recorded on it and integrating the esthetic evaluation with biologic and functional parameters will really allow dentist to formulate a correct diagnosis and to choose most suitable treatment plan for the patient. The aim of this study was to evaluate the prevalence of facial and dentolabial parameters among students of the Faculty of Dentistry of Lithuanian University of Health Sciences and to identify relationship of all facial and dentolabial parameters results.

Material and methods. The study is carried out at the Department of Dental and Maxillofacial Orthopedics of Lithuanian University of Health Sciences. The facial and dentolabial parameters of students are examined by visual examination using medical gloves and rulers. Participants were sitting on a chair at a distance of 150 cm in front of the researchers.

Results. The thick type of lips was the most popular for normal profile face, of thin lips – concave, of medium lips type – convex. The most popular of profile face types were normal and convex. The most popular tooth exposure among all smile line types was less than half teeth. Type when more than half of teeth was diagnosed in the most of high “Gummy smile”.

Conclusions. Was found relationship between: the profile of face and type of lips; the tooth exposure at rest and type of smile line; the commissural line vs horizon and interpupillary line vs horizon; the facial midline and occlusal plane vs commissural line/horizon; the type of smile line and type of lips; the labial corridor and 10 teeth number of smile width type.

Keywords: dentolabial, facial parameters, dentofacial esthetic.

INTRODUCTION

Today's society emphasizes the importance of attractive physical appearance and facial beauty. Patients are increasingly taking dental treatment, orthodontic and orthognathic surgical treatment, plastic-surgical treatment to improve their facial appearance (1). Therefore, inspired by pretty faces and beautiful smiles, patients want to improve dentofacial esthetics and to see positive changes in their smile by applying various treatment modalities (2). Nowadays esthetic checklist is an indispensable assistance for the dental clinics. Processing the information recorded on it and integrating the esthetic

evaluation with biologic and functional parameters will really allow odontologist to formulate a correct diagnosis and to choose most suitable treatment plan for the patient (3).

The parallelism of the anterior incisal curve with the lower lip, the upper lip position and curvature, the number of teeth showed when person is smiling, the relationship between the maxillary anterior teeth and the lower lip are the various characteristics that affects the smile esthetics. The facial midline is usually the starting point of the esthetic treatment plan (4).

The aim of this study was to evaluate the prevalence of facial and dentolabial parameters among students of the Faculty of Dentistry of Lithuanian University of Health Sciences between men and women; as well as to investigate and to identify relationship of all facial and dentolabial parameters results.

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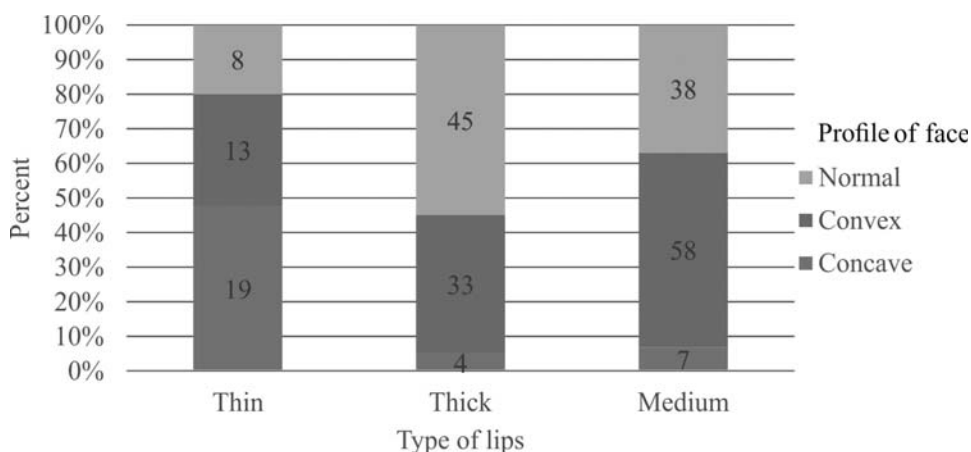


Fig. 1. The types of lips and profile of face types relationship

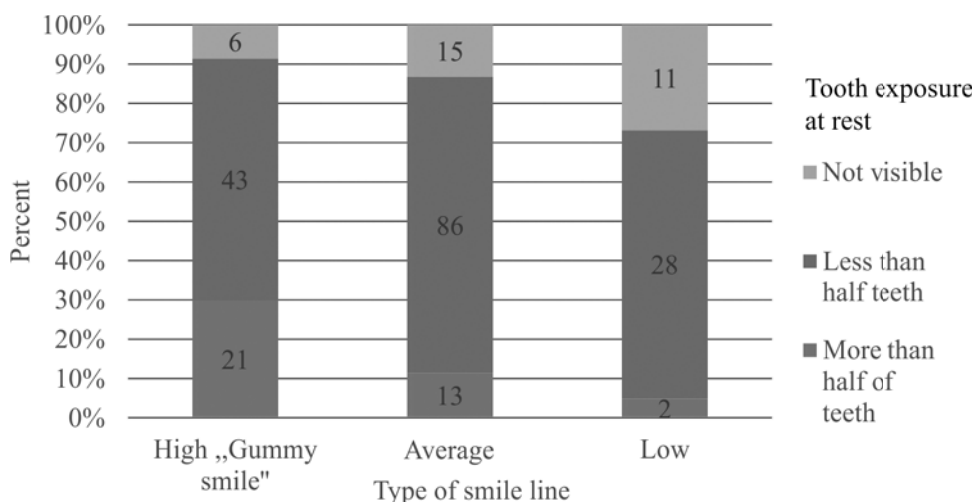


Fig. 2. The type of smile line and tooth exposure at rest positions relationship

MATERIAL AND METHODS

The study is carried out at the Department of Dental and Maxillofacial Orthopedics of Lithuanian University of Health Sciences.

In this study esthetic analysis was performed

according Fradeani (3). The study used the following analysis: facial, dentolabial and tooth of each participant. In facial analysis was evaluated interpupillary line vs horizon, commissural line vs horizon, facial midline, profile and lips. Dentolabial analysis was performed evaluating tooth exposure at rest and in maximum smiling evaluating incisal curve vs lower lip, smile line, smile width, labial corridor, upper interincisal line vs midline. finally in tooth analysis was evaluated maxillary vs mandibular interincisal line and central incisor type (ovoid, tapering, square).

Participants are selected based on the following selection criteria:

1. Students of the Faculty of Dentistry from 19 to 34 years old.
2. A full upper and lower arch of teeth, regardless of the presence or absence of third molars.
3. Skeletal and dental Angle I class.
4. There are no symptoms due to pathological changes (paralysis) or lips disorders.
5. The front teeth are not damaged by caries, no composite fillings or prosthetic crowns; a healthy

Table 1. The esthetic criterias of the face types, interpupillary and commissural lines vs horizon distribution between different sex in percents

	Type of face				Interpupillary line vs horizon			Commissural line vs horizon		
	Oval	Around	Square	Tapering	Parallel	Slanted to right	Slanted to left	Parallel	Slanted to right	Slanted to left
Females	40.11	15.93	38.46	5.49	49.45	10.99	39.56	51.10	15.38	33.52
Males	51.43	17.14	31.43	0.00	39.53	18.60	41.86	62.79	9.30	27.91
All subject	41.94	16.13	37.33	4.61	47.56	12.44	40.00	53.33	14.22	32.44

Table 2. The esthetic criterias of the facial midline, face profile and lips types distribution between different sex in percents

	Facial midline			Type of face profile			Type of lips		
	Centered	Deviated to right	Deviated to left	Normal	Convex	Concave	Thick	Medium	Thin
Females	63.19	22.53	14.29	42.31	49.45	8.24	18.68	45.60	35.71
Males	58.14	30.23	11.63	62.79	27.91	9.30	13.95	46.51	39.53
All subject	62.22	24.00	13.78	46.22	45.33	8.44	17.78	45.78	36.44

gum and periodontium without any changes, there is no gum recession.

6. No diasthema between the front teeth, more pronounced changes in the position of the teeth (displacement, turning).

7. No orthodontic treatment or surgery in the area of the maxillo-facial.

8. No maxillo-facial injuries.

The research data collected by completing the questionnaire by two researchers. Students are examined by visual examination using medical gloves and rulers. Participants sit on a chair at a distance of 150 cm in front of the researchers. They were informed and trained to keep their head in a natural position and look directly into the researchers

eyes. In the facial analysis participants relaxed, easy to hold their lips together. During dentolabial analysis participants should be at rest position or smiling as much as possible. Each aspect of the study evaluated three times in order to make data more reliable.

The statistical analysis performed using the "IBM SPSS Statistics 23" and "Microsoft Excel 2016" software.

The significance level α was chosen 0.05. In the study used Chi-Square statistic to evaluate relationships between categorical variables.

RESULTS

A total of 227 lithuanian odontology students (187 women and 40 men); (22.12±2.1) mean age; age range 19 to 34 years) who fulfilled the inclusion

criteria were included in this study. Table 1 presents comparison the esthetic criterias of the facial, dentolabial and tooth distribution between different sex.

Table 3. The esthetic criterias of the tooth exposure at rest and incisal curve vc lower lip distribution between different sex in percents

	Tooth exposure at rest			Incisal curve vc lower lip					
	More than half of tooth	Less than half tooth	Not visible	Convex	Flat	Reserve	Contacting	Not contacting	Covering
Females	19.23	67.03	13.74	0.55	2.20	35.16	14.84	39.01	8.24
Males	2.33	81.40	16.28	2.33	0.00	9.30	25.58	53.49	9.30
All subject	16.00	69.78	14.22	0.99	1.98	33.66	18.81	46.53	9.41

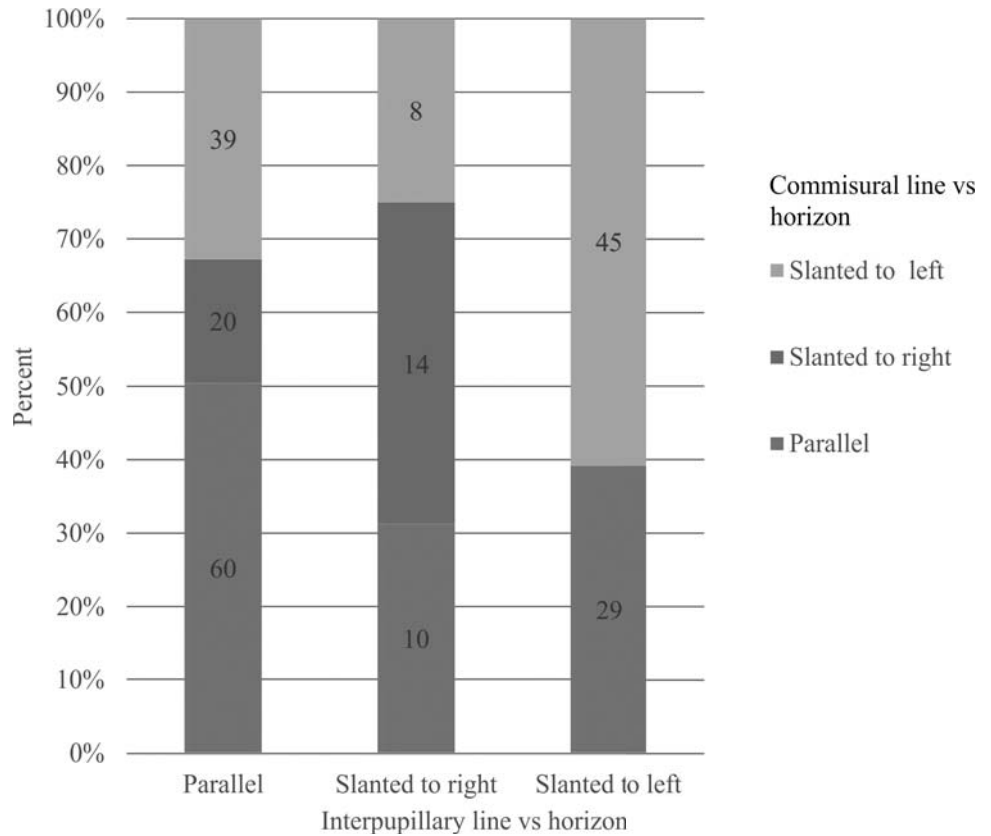


Fig. 3. The inter pupillary and commissural lines vs horizon relationship

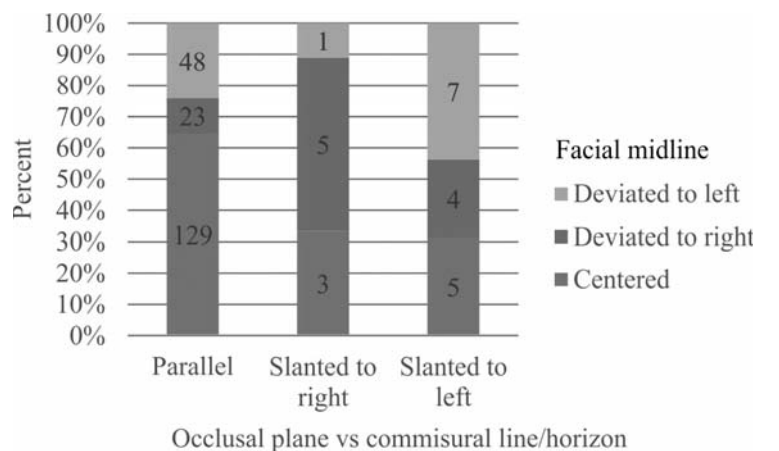


Fig. 4. The occlusal plane vs commissural line/horizon and facial midline relationship

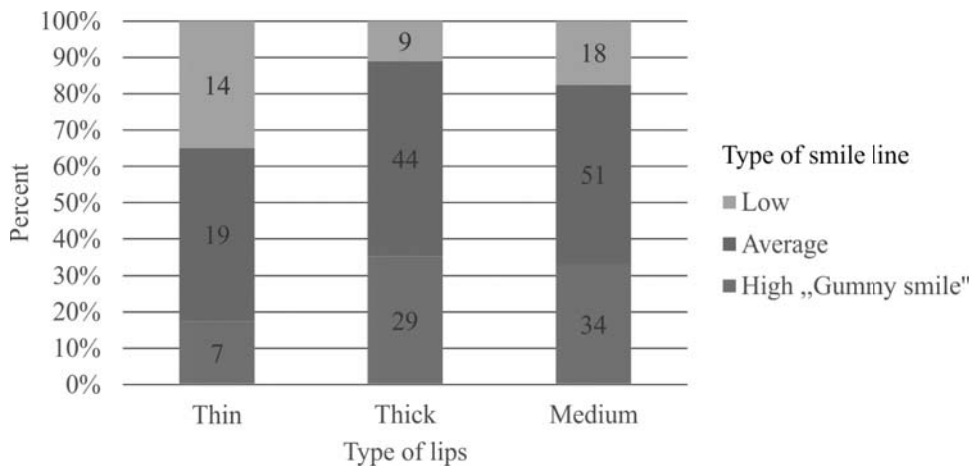


Fig. 5. The type of lips and type of smile line relationship

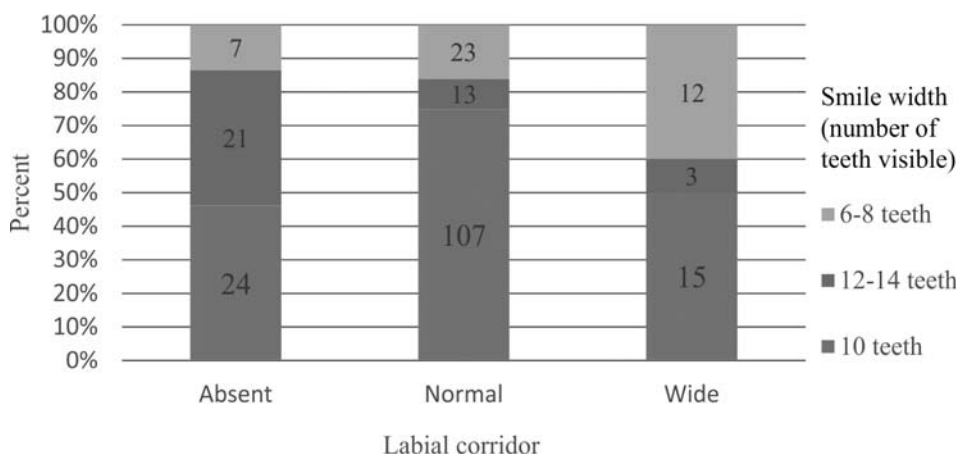


Fig. 6. Smile line (number of teeth visible) and of labial corridor relationship

The most popular of profile face types were normal (40.4%) and convex (46.2%) (Fig. 1). However profile of face types and central incisors types (oval, around, square or tapering) not was statistically significant (p=0.568).

The tooth exposure at rest of less than half teeth and smile line for all types was statistically significant (p=0.000): high "Gummy smile" (61.4%), average (75.4%) and low (68.3%). The most popular tooth exposure among all smile line types was less than half teeth (Fig. 2). However in case of low smile line very often results was not visible type of exposure at rest (27%). Type when more than half of teeth were diagnosed in the most of high "Gummy smile" (58.3%).

Table 4. The esthetic criterias of smile line, smile width, labial corridor and teeth type distribution between different sex in percents

	Type of smile line			Smile width (number of teeth visible)			Labial corridor		Type of teeth			
	Average	Low	High "Gummy smile"	6-8	10	12-14	Normal	Wide	Absent	Ovoid	Tapering	Square
Females	53.30	15.93	30.77	20.88	65.38	13.74	62.09	13.74	24.18	26.92	15.93	57.14
Males	39.53	27.91	32.56	9.30	62.79	27.91	69.77	11.63	18.60	32.56	13.95	53.49
All subject	50.67	18.22	31.11	18.67	64.89	16.44	63.56	13.33	23.11	28.00	15.56	56.44

Table 5. The esthetic criterias of upper interincisal line vs midline, occlusal plane vs commissural line/horizon and maxillary vs mandibular interincisal line distribution between different sex in percents

	Upper interincisal line vs midline			Occlusal plane vs commissural line/horizon			Maxillary vs mandibular interincisal line		
	Coincident	Deviated to right	Deviated to left	Parallel	Slanted to right	Slanted to left	Coincident	Deviated to right	Deviated to left
Females	60.44	25.82	13.74	90.66	3.85	5.49	40.66	30.22	29.12
Males	53.49	27.91	18.60	81.40	4.65	13.95	37.21	27.91	34.88
All subject	59.11	26.22	14.67	88.89	4.00	7.11	40.00	29.78	30.22

The facial midline and occlusal plane vs commissural line/horizon was statistically significant ($p=0.028$), when facial midline centered and often was parallel of occlusal plane vs commissural line/horizon type (64.5%); when deviated to right of facial midline type often slanted to right of occlusal plane vs commissural line/horizon type (55.5%); and when deviated to left of facial midline often slanted to left of occlusal plane vs commissural line/horizon type (43.8%) (Fig. 4). However the facial midline and maxillary vs mandibular interincisal line not was statistically significant ($p=0.310$).

The average of smile line and for all types of lips (thin (47.5%), thick (53.7%), medium (49.5%)), was statistically significant ($p=0.019$) (Fig. 5).

The labial corridor different types and 10 teeth of smile width (number of teeth visible) was statistically significant ($p=0.000$), when labial corridor was: average (46.1%); normal (74.8%), wide (50%) the smile width the most popular 10 teeth for all (Fig. 6).

DISCUSSION

Our study found some correlation e.g. thick type of lips was the most popular for normal profile face, of medium lips type – convex profile. Therefore in case of low smile line very often was not visible tooth exposure at rest. Furthermore type when more than half of tooth exposure at rest was diagnosed in the most of high "Gummy smile".

However, in this study correlation between profile of face and central incisors types not was statistically significant ($p=0.568$). Williams (5) geometric theory declare that there is matching of the form of the face and the form of upper central incisor, although postulated at the beginning of the century, is still the most common theory for the choice of artificial teeth. It is mentioned in almost all the prosthodontic textbooks in the world. Many authors agree with this theory, but some studies lead to the opposite results (6).

In our study relationship between facial midline and maxillary vs mandibular interincisal line not was found. A study by Miller (7) showed that the midline is in the exact middle of the mouth in approximately

70 percent of people, and the maxillary and mandibular interincisal lines fail to coincide in almost three-fourths of the population. However, Soares (8) found that the coincidence of facial midline with the arch midline occurred in only half of the dental students. Therefore, the mandibular interincisal line cannot be used as a reference point by the dental technician in deciding where to put the maxillary interincisal line (9).

Assessment of dental and facial esthetics parameters is one of the key elements in diagnosis and treatment planning in prosthetic dentistry. It must be understood that there is no universal ideal smile. The most important esthetic goal is to achieve a balanced smile (10).

However, in the future, further studies with large population are needed to establish and validate the relationship between facial, labial and dental parameters influencing dento facial esthetics.

CONCLUSIONS

The findings of this study statistically significant:

1. The thick type of lips is the most popular for normal profile face (54.9%), of medium lips type – convex (56.3%), of thin – convex profile of face (47.5%).
2. When interpupillary line is parallel and commissural line often parallel (50.4%); when interpupillary line slanted to right and commissural line often slanted to right (43.8%); when interpupillary line slanted to left and commissural line often slanted to left (53.6%).
3. The average of smile line is the most popular for all types of lips (thin (47.5%), thick (53.7%), medium (49.5%).
4. When labial corridor is: average (46.1%); normal (74.8%), wide (50%) the smile width the most popular 10 teeth for all types of labial corridor.

STATEMENT OF CONFLICTS OF INTEREST

The authors declare that they have no conflict of interest.

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