

UPPER LABIAL FRENUM ATTACHMENT AND MEDIUM DIASTEMA; A COMPARATIVE STUDY BETWEEN KURDISH AND ARAB TEENAGERS IN ZAKHO CITY, KURDISTAN, IRAQ.

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ABSTRACT

Background: To find out the various types of upper labial frenum attachment in both ethnic groups, to compare the various types of upper labial frenum attachment between both ethnics and sexes in the groups and to estimate the presence and measurement of medium diastema in both ethnics and sexes in the groups.

Subject and Methods: A cross sectional study encompassed 307 Arab and Kurdish secondary school students aged 15-19 years in Zakho city. Kurdish group included 176 teenagers (82 males and 94 females). Arab group included 131 teenagers (55 males and 76 females). By using dental mirrors, Williams periodontal probes and gloves each subject was examined in term of evaluation of the frenum attachment level and measurement of the medium diastema then recording the data in a designed questionnaire.

Results: The results revealed that frenum classes; I (frenum fibers are attached up to mucogingival junction), II (frenum fibers are inserted within attached gingiva), III (frenum fibers are extending into inter dental papilla), IV (frenum fibers cross the alveolar process and extend up to palatine papilla), were found in (36.6%, 58.8%, 3.1%, 1.5%) respectively of Arab teenagers and in (34%, 57.3%, 6.2%, 2.2%) respectively of Kurdish teenagers. There were no significant differences in frenum classes neither between Arab males and females nor between Kurdish males and females, while the difference was significant in frenum classes between Arab and Kurdish teenagers. The diastemas (0mm, 1mm, 2mm, 2.5mm, 3mm, 4mm) were found in (81.6%, 4.5%, 9.1%, 0.7%, 3%, 0.7%) respectively of Arab teenagers and in (88.6%, 0.5%, 3.4%, 3.4%, 0.5%, 1.7%) respectively of Kurdish teenagers.

Conclusions: The study concluded that the majority of both Arab and Kurdish teenagers have no diastema and the majority of them have class II frenum attachment. Arab teenagers have more proportions of class I, II and IV frenum attachment, except class III, and more proportions of having diastema than Kurdish teenagers.

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Keywords: Frenum attachment, frenum class, diastema, Arab teenagers, Kurdish teenagers

Frenum attachments are thin folds of mucous membrane with enclosed muscle fibers that attach the lips to the alveolar mucosa and underlying periosteum. Most often, during the oral examination of the patient the dentist gives

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very little importance to the frenum, for assessing its morphology and attachment. One of the more interesting yet often misunderstood anatomic structures in the oral cavity is the frenum- a mucosal attachment of a loose part to a more rigid part¹. It contains a variable amount of collagenous fibrous tissues and its size varies from person to person². A frenulum is a small frenum. There are several frena that are usually present in a normal oral cavity, most notably the maxillary labial frenum, the mandibular labial frenum, and the lingual frenum. Their primary function is to provide stability of the upper and lower lip and the tongue³.

The extent of their involvement in mastication is in dispute. Labial frenum is originating from orbicularis oris muscle of upper lip that attach at the lips to the alveolar mucosa and underlying periosteum. It extends over the alveolar process in infants and forms a raphe that reaches the palatal papilla. Through the growth of alveolar process as the teeth erupt, this attachment generally changes to assume the adult configuration⁴. Abnormal or aberrant frena are detected visually, by applying tension over it to see the movement of papillary tip or blanching produced due to ischemia of the region. Clinically, papillary and papilla penetrating frena are considered as pathological and have been found to be associated with loss of papilla, recession, diastema, difficulty in brushing, malalignment of teeth and it may also prejudice the denture fit or retention leading to psychological disturbances to the individual⁵.

Frenum attachment can be classified into:

CI I (Mucosal): when the frenum fibers are attached up to mucogingival junction.

CI II (Gingival): when fibers are inserted within attached gingiva.

CI III (Papillary): when fibers are extending into inter dental papilla.

CI IV (Papilla penetrating): when the frenum fibers cross the alveolar process and extend up to palatine papilla⁶.

A diastema is a distinctive space or gap between two teeth^{7,8} and it is a common aesthetic, psychological impairment and distress for patients^{9,10}. It occurs more frequently in the median plane of the maxillary arch between the two central incisors and hence called the median, central or midline diastema¹¹ and likely its more than 0.5mm¹². The true midline diastema is that one been without periodontal/periapical involvement and with the presence of all the anterior teeth in the arch¹¹. Naturally occurring midline diastema may result from a wide range of causes¹³. Possible etiologies include genetic, dentoalveolar disproportion, a missing tooth, peg shaped lateral, unerupted midline supernumerary teeth, proclination of the upper labial segment, prominent frenum and due to a self-inflicted pathology by tongue piercing^{14,15}.

PATIENTS AND METHODS

A cross sectional study was conducted in January 2016 and included both Arab and Kurdish secondary school students aged 15-19 years in Zakho city. Examination included 307 teenagers, 176 Kurds group (82 males and 94 females) and 131 Arabs group (55 males and 76 females).

Selection criteria included: 1- full erupted upper permanent canine. 2- Medically fit subjects not suffering from periodontitis,

whose labial frenum and adjacent mucosa was not affected by trauma and not been subjected to any plastic surgery. 3- No history of congenital defects (cleft lips and palate). 4- No missing upper permanent teeth.

Through using dental mirrors and gloves, the level of frenum attachment was characterized for each subject by stretching the upper lip gently in horizontal direction away from the alveolar process, inspecting the frenum, moving the lip up and down to check frenum relation with underlying soft tissues then recording its class in a designed questionnaire. By using Williams periodontal probe the medium diastema of the same subject was recorded through measuring the distance from the mesio-incisal line angle of one central incisor to the mesio-incisal line angle of the other central incisor.

STATISTICAL ANALYSIS

Data were collected and analyzed using statistical packages, namely SPSS version 19.0. Statistical significance association among different types of both frenum and diastemas was reported using Chi square test. *P*-value less than 0.05 is considered as statistically significant.

RESULTS

The results revealed that frenum classes (I, II, III, IV) were found in (36.6%, 58.8%, 3.1%, 1.5%) respectively of Arab teenagers in **Figure 1**, in (18.32%, 21.37%, 1.5%, 0.7%) respectively of Arab males and in (18.32%, 37.4%, 1.5%, 0.7%) respectively of Arab females in **Table 1**, and in (34%, 57.3%, 6.2%, 2.2%) respectively of Kurdish teenagers in **Figure 2**, in (15.9%, 26.7%, 2.84%,

1.13%) respectively of Kurdish males and in (18.18%, 30.68, 3.4%, 1.13%) respectively of Kurdish females in **Table 2**. There were no significant differences in frenum classes neither between Arab males and females nor between Kurdish males and females (**Table 3 & 4**), while the difference was significant in frenum classes between Arab and Kurdish teenagers as it shown in **Table 5**.

The diastemas (0mm, 1mm, 2mm, 2.5mm, 3mm, 4mm) were found in (81.6%, 4.5%, 9.1%, 0.7%, 3%, 0.7%) respectively of Arab teenagers **Figure 3**, in (35.11%, 2.29%, 3.81%, 0.7%, 0.0%, 0.0%) respectively of Arab males and in (46.56%, 2.29%, 5.34%, 0.0%, 3%, 0.7%) respectively of Arab females (**Table 6**), and in (88.6%, 0.5%, 3.4%, 3.4%, 0.5%, 1.7%) respectively of Kurdish teenagers **Figure 4**, in (40.9%, 0.5%, 2.27%, 2.27%, 0.5%, 0.0%) respectively of Kurdish males, and in (47.72%, 0.0%, 1.13%, 2.84%, 0.0%, 1.7%) respectively of Kurdish females (**Table 7**).

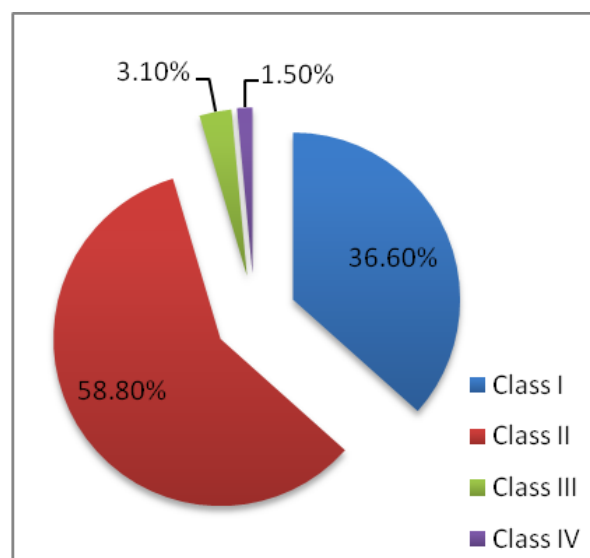


Figure 1: Arab frenum classes

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Table 1: Arab frenum classes; Males and Females

Sex	No.	Class			
		I	II	III	IV
Male	55 (41.98%)	24 (18.32%)	28 (21.37%)	2 (1.5%)	1 (0.7%)
Female	76 (58.01)	24 (18.32%)	49 (37.4%)	2 (1.5%)	1 (0.7%)
Total	131 (100%)	48 (36.6%)	77 (58.8%)	4 (3.1%)	2 (1.5%)

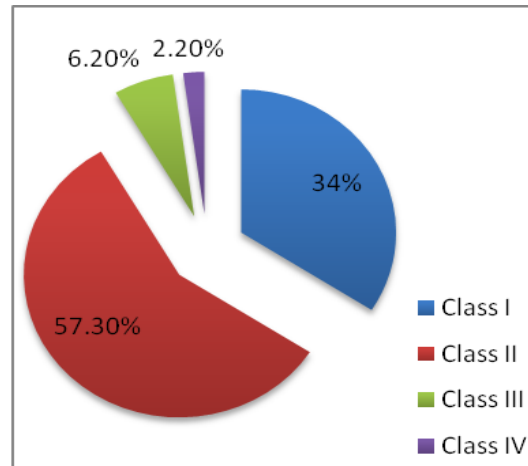


Figure 2: Kurdish frenum classes

Table 2: Kurdish frenum classes; Males and Females

Sex	No.	Class			
		I	II	III	IV
Male	82 (46.59%)	28 (15.9%)	47 (26.7%)	5 (2.84%)	2 (1.13%)
Female	94 (53.4%)	32 (18.18%)	54 (30.68)	6 (3.4%)	2 (1.13%)
Total	176 (100%)	60 (34%)	101 (57.3%)	11 (6.2%)	4 (2.2%)

Table 3: Frenum classes differences between Arab males and females

Sex	Class				Chi square	P-value
	I	II	III	IV		
Arabs	Males	24 (18.32%)	28 (21.37%)	2 (1.52%)	1 (0.76%)	3.366 131 (100%) 0.067
	Females	24 (18.32%)	49 (37.4%)	2 (1.52%)	1 (0.76%)	
	Total	48 (36.64%)	77 (58.77%)	4 (3.05%)	2 (1.32%)	

Table 4: Frenum classes differences between Kurdish males and females

Sex	Class				Chi square	P-value
	I	II	III	IV		
Males	28 (15.9%)	47 (26.7%)	5 (2.84%)	2 (1.13%)	0.818	0.366
Kurds Females	32 (18.18%)	54 (30.68)	6 (3.4%)	2 (1.13%)		
Total	60 (34.09%)	101 (57.38%)	11 (6.25%)	4 (2.27%)	176 (100%)	

Table 5: Frenum classes differences between Arabs and Kurds

Ethnics	Class				Chi square	P-value
	I	II	III	IV		
Arabs	48 (15.63%)	77 (25.08%)	4 (1.3%)	2 (0.65%)	6.596	0.01
Kurds	60 (19.54%)	101 (32.89%)	11 (3.58%)	4 (1.3%)		
Total	108 (35.17%)	178 (57.98%)	15 (4.88%)	6 (1.95%)	307 (100%)	

Table 6: Arab Diastema; Males and Females

Sex	No.	Diastema					
		0 mm	1 mm	2 mm	2.5 mm	3 mm	4 mm
Male	55 (41.98%)	46 (35.11%)	3 (2.29%)	5 (3.81%)	1 (0.7%)	0 (0.0%)	0 (0.0%)
Female	76 (58.01%)	61 (46.56%)	3 (2.29%)	7 (5.34%)	0 (0.0%)	4 (3%)	1 (0.7%)
Total	131 (100%)	107 (81.6%)	6 (4.5%)	12 (9.1%)	1 (0.7%)	4 (3%)	1 (0.7%)

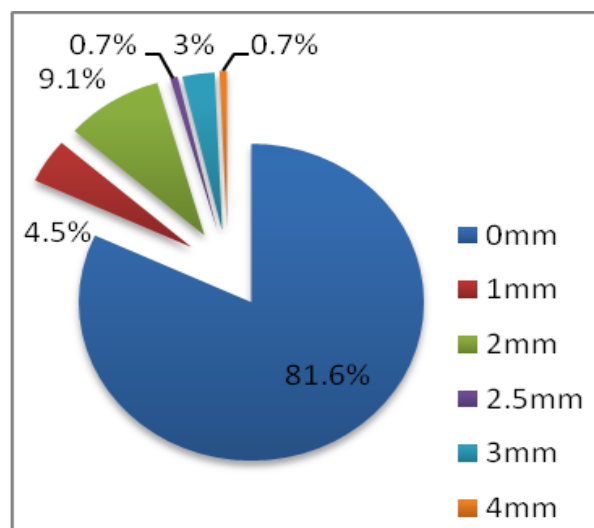
**Figure 3: Arab Diastema**

Table 7: Kurdish Diastema; Males and Females

Sex	No.	Diastema					
		0 mm	1 mm	2 mm	2.5 mm	3mm	4mm
Male	82 (46.59%)	72 (40.9%)	1 (0.5%)	4 (2.27%)	4 (2.27%)	1 (0.5%)	0 (0.0%)
Female	94 (53.4%)	84 (47.72%)	0 (0.0%)	2 (1.13%)	5 (2.84%)	0 (0.0%)	3 (1.7%)
Total	176 (100%)	156 (88.6%)	1 (0.5%)	6 (3.4%)	9 (5.1%)	1 (0.5%)	3 (1.7%)

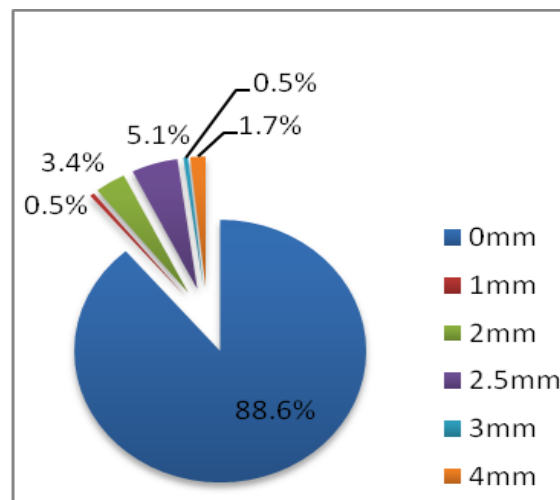


Figure 4: Kurdish Diastema

DISCUSSION

Frenum is a fold of non-keratinized mucosa that has different levels of attachment to the underlying soft tissues. High-level attached frenum might account for creation of some obstacles during orthodontic treatment, besides emerging some of mucogingival defects, which in turn considered as causal factors for other esthetically undesirable conditions such as gingival recession. Medium diastema is a space between the maxillary central incisors and it is a common aesthetic complaint of the patients; a problem which motivates patients for seeking treatment orthodontically or conservatively.

The existing cross sectional study has been conducted on 307, 15-19 years of age,

secondary school Arab and Kurdish teenagers in Zakho city. Arab sample showed higher percentage of having diastema than Kurdish sample. Both Arab and Kurdish samples showed higher percentages of class II (Gingival type) frenum attachment and least percentages of class IV (Papillary penetrating type) frenum attachment. These findings were agreed with results conducted by Upadhyay and Ghimire, 2012², as well as with results reported by Dler et al., 2015¹⁶, but disagreed with results reported by Janczuk et al., 1980¹⁷ that found higher prevalence of class I frenum attachment (39%) followed by class II frenum attachment (36%) among 1542 polish teen.

The data of the current study confirm the hypothesis of a possible genetic basis and a greater role of environmental factors¹⁸ of both ethnic groups. The study has withdrawn the following conclusions:

- 1- The majority of both Arab and Kurdish teenagers have no diastema and the majority of them have class II frenum attachment.
- 2- Arab teenagers have more proportions of class I, II and IV frenum attachment, except class III, and more proportions of having diastema than Kurdish teenagers.

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پوخته

جوړین لښا یښ بیکفه کړیدای و بوساییا نافین . ښه کولینه کا به راوردی دناښه را سنیله یښ کوردو عه ره ب ل باژیری زاخو ل کوردستانا عیراقی

پښه کی و نارمانج: نارمانجین سهره کی: ژ بو زانینا جوړین لښا یښ لای پستی ژ ناف کومین نه تنیکی (جماعات عرقیه) و ژ بو دیارکرن و زانینا هه بوون و بیقانا (ښاهیا دنیف دانا دا) دناښه را وان کومین نه تنیکی و نه و ره گه زین هاتینه ژ ښکرتن د قی ښه کولینی دا، و هه قبه رکرنا جوړین لښا یښ پستی و جودا کرنا وان دناښه را وان کس و کومین نه تنیکی نه وین هاتینه ژ ښکرتن بو ښه کولینی.

ریکین ښه کولینی: د قی ښه کولینی دا 307 کس به شدار بوون (کورد و عهره ب) قوتابیښ ل قوتابیښ نافنجی ، ته مه نین وان دناښه را (15 تا 19) سال ل باژیری زاخو. نه ښ قوتابیښ به شدار ل سهر دوو گرویان دابه ش بوون، گرویی (کوردستان) کو هژمارا وان (176) سنیله بوون (82 کچ و 94 کور). گرویی (عهره بان) پیکهاتبوو ژ (131) سنیله یان (55 کور و 76 کچ). و پست به ستنا ده زگورکین پاقر یښ پلاستیکی . نه ښه هاتنه ب کار نینان ژ بو پشکین و چاره سهری ب ریکا هه لسه نگاندنا ناستی (ناینکس: المرفق) و بیقانا ښاهیا دناښه را دانا دا، دویف دا تومارکنا دانه یښ وئ ب ریکا تومار دانه یان یښ راستقه کری.

نه انجام و دهر نه انجام: دهر نه انجامین نه م گه هشتینی بو مه دیار کر کو ښاهیا دناښه را دانا ب قی شیوه ی بوون:

0mm, 1mm, 2mm, 2.5mm, 3mm, 4mm کو ب ریژه یا: 81.6%, 4.5%, 9.1%, 0.7%, 3%, 0.7% ل ده ښ سنیله یښ نه ته وه عهره ب و ب ریژه یا: 88.6%, 0.5%, 3.4%, 0.5%, 1.7% ل ده ښ سنیله یښ نه ته وه کورد هاته دیتن و دیارکرن

الخلاصة

التصاق المرفق الشفوي العلوي والفراغ بين سني الامامي العلوي. دراسة مقارنة بين المراهقين الأكراد والمراهقين العرب في مدينة زاخو، كردستان، العراق.

الخلفية والأهداف: التعرف على أنواع مختلفة من المرفق العلوي من الجنين الشفوي في كل من المجموعات العرقية، لتقدير وجود وقياس الفراغ بين سني الامامي العلوي في كل من العرق والجنس في المجموعات ومقارنة أنواع مختلفة من التصاق المرفق الشفوي العلوي بين كل من العرق والجنس في المجموعات.

طرق البحث: شملت دراسة مقطعية 307 طالبا من طلاب المدارس الثانوية العربية والكردية الذين تتراوح أعمارهم بين 15 و 19 عاما في مدينة زاخو. وتضمنت المجموعة الكردية 176 مراهقا (82 من الذكور و 94 من الإناث). وتضمنت المجموعة العربية 131 مراهقا (55 ذكور و 76 إناث). باستخدام مرايا الأسنان، تم الفحص باستخدام ادات ويليامز لقياس مؤشرات اللثة والقفاذات. كل المراهقين تم فحصهم في تقييم مستوى التصاق المرفق الشفوي العلوي وقياس الفراغ بين سني الامامي العلوي. ثم تسجيل البيانات في استبيان المصممة.

النتائج: أظهرت النتائج أن الفراغ بين سني الامامي العلوي (1mm, 2mm, 2.5mm, 3mm, 4mm , 0mm) وجدت في (81.6%، 4.5%، 9.1%، 0.7%، 3%، 0.7%) على التوالي من المراهقين العرب (88.6%، 0.5%، 3.4%، 3.4%، 0.5%، 1.7%) على التوالي من المراهقين الأكراد. (36.6% و 58.8% و 3.1% و 1.5%) على التوالي من المراهقين العرب و 34% و 57.3% و 6.2% و 2.2% على التوالي من المراهقين الأكراد (الأول والثاني والثالث والرابع). لم تكن هناك فروق ذات دلالة إحصائية في صفوف الجنسين بين الذكور والإناث العرب، ولا بين الذكور والإناث الكرد، في حين كان الفرق كبيرا في فصول الجنسين بين المراهقين العرب والكرد.

الاستنتاجات: خلصت الدراسة إلى أن غالبية المراهقين العرب والكورد ليس لديهم فراغ بين سني الامامي العلوي ، وغالبيتهم من الطبقة الثانية. المراهقين العرب لديهم نسب أكبر من الطبقة الأولى والثانية والرابعة من التصاق المرفق الشفوي العلوي، باستثناء الفئة الثالثة، ونسب أكثر من وجود الفراغ بين سني الامامي العلوي من المراهقين الأكراد.