

## Cheiloscopy among the Igbo Students in Madonna University Elele, Rivers State, Nigeria

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### Original Research Article

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**Abstract:** Lip prints are normal lines and fissures in the forms of wrinkles and grooves present in the zone of transition of human lip, between the inner labial mucosa and outer skin. Examination of this lip prints is known as cheiloscopy. Some authors have worked on lip print in the past and made some striking points on its application in forensic studies and human identification. The study was carried out to identify and compare the lip prints patterns among the Igbos. The study was done to investigate and document the characteristic cheiloscopic pattern of Igbos and to assess the distribution of lip print patterns among males and females. A total of 300 subjects were used for the study. 150 were males, 150 were females, all of which were normal subjects. Subjects were selected and identified based on an oral interview. These subjects were selected through purposive convenient sampling method. The males and females had their highest percentage distribution in type I (35.73%) and (30.53%) respectively; the least percentage was in type IV (9.33 %) for the males and type I' (7.80%) for the females. this study has been able to establish the cheiloscopic patterns for the Igbo ethnic group in Nigeria. The dominant pattern of the population was type I followed by type II and the least was type I'. It also revealed sexual dimorphism in the patterns and frequency of distribution of lip prints.

**Keywords:** Cheiloscopy, Igbo, Madonna, Elele.

### INTRODUCTION

Cheiloscopy is derived from two Greek words 'CHELIOS' and 'SKOPEIN' meaning lips and see respectively [1]. Lip prints are normal lines and fissures in the forms of wrinkles and grooves present in the zone of transition of human lip, between the inner labial mucosa and outer skin. Examination of this lip prints is known as cheiloscopy.

Lip prints develop in the same first weeks of embryological life as the lip. It is unaltered from six week of intrauterine life till death. It can be visibly seen with the naked eyes like with lipstick and latent prints are not visible with naked eyes [2].

Two Japanese scientists, Tsuchihashi and Suzuki in the period 1968-71, established that the arrangement of lines on the red part of the human lip is individual and unique for each human being. The grooves present on human lips (Sulci labiorum) are unique to each person and can be used to determine identity [3]. This is unique for individuals, as finger prints [4].

Cheiloscopy has found application in establishing ethnic differences [5]. Cheiloscopic techniques have an equal value in relation to other types of forensic evidences for personal identification [6] and sex determination [7]. In a crime scene investigation, lip prints can link a subject to a specific location if found on cloths or other subjects, such as glasses, cups or even cigarette butts[8]. Analysis of the lip prints left at the scene of crime, and their comparison with those of suspected person may be useful for identification [9].

Personal identification is much necessary for unknown deceased persons in homicide, suicide, accidents, and most disasters. It is also necessary for

living individuals who are missing persons due to amnesia and culprits hiding his identity[4].

#### Applications of Cheiloscopy

- Genetic Marker and Diagnostic Tool
- Personal Identification
- Crime Investigation
- Sex Identification

#### Anatomy of the Lips

Lips are two highly sensitive mobile folds, composed of skin, muscle, glands and mucous membrane. They surround the oral orifice and form the anterior boundary of the oral cavity. Anatomically, whether covered with skin or mucosa, the surface that forms the oral sphincter is the lip area. There is an upper lip (from under the nose and extending laterally toward the cheek from the nasolabial sulcus) and a

lower lip (bound inferiorly by a prominent groove, the labiomental sulcus); the two lips are joined at the corners of the mouth - the commissures - and separated by the buccal fend [9]. There are two different kinds of lip covering skin or mucosa. When the two meet, a white wavy line is formed - the labial cord - which is quite prominent in Negroes. Where identification is concerned, the mucosal area holds the most interest. This area, also called Klein's zone is covered with wrinkles and grooves that form a characteristic pattern of the lip print. <sup>[10]</sup> However, this is not the only area that deserves careful study. In fact, in cheiloscopy, one should also analyze lip anatomy, considering their thickness and the position. The lips can be horizontal, elevated or depressed and, according to their thickness, it is possible to identify the following four groups [11].

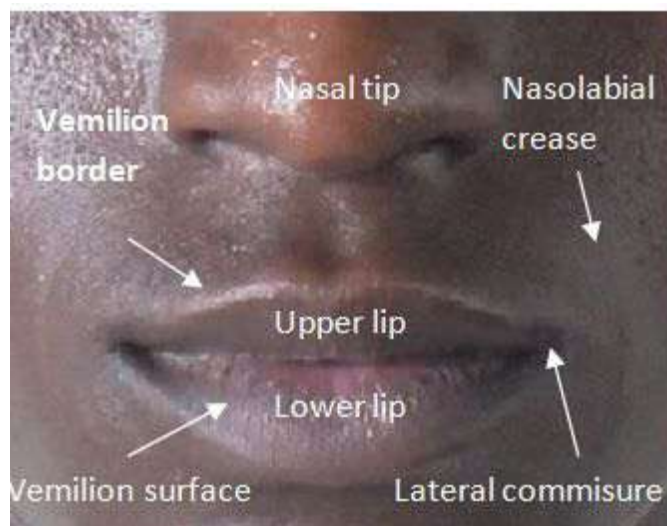


Fig-1: Parts of the Lip

#### The Igbo People

The Igbo people, historically spelled Ibo, are an ethnic group of south eastern Nigeria. They speak Igbo, which includes various Igboid languages and dialect. Igbo people are one the largest ethnic groups in Africa. In rural Nigeria, Igbo people are mostly craftsmen, farmers and traders. The igbo in Nigeria are found in Abia, Anambra, Benue, Ebonyi, Edo, Imo, Enugu, Delta and Rivers state. The Igbo language is predominant throughout these areas. South eastern Nigeria, which is inhabited by primarily by the Igbo, is the most densely populated area in Nigeria and possibly in all of Africa. Most ethnicities that inhabit south eastern Nigeria, such as the closely related Efik, Ibibio, and Ikwerre people, are sometimes regarded as Igbo by other Nigerians and ethnographers who are not well informed about the southeast [12].

Some authors have worked on lip print in the past and made some striking points on its application in forensic studies and human identification [13-33].

#### Aim of Study

The study was carried out to identify and compare the lip prints patterns among the Igbos.

#### Objectives of the Study

The study was done to investigate and document the characteristic cheiloscopic pattern of Igbos and to assess the distribution of lip print patterns among males and females

#### Scope of the Study

This study was limited to the cheiloscopy among the Igbos in Madonna University Elele Campus, Rivers State.

#### MATERIALS AND METHODS

##### Research Design

The study was non-experimental and analytical.

### Subject Selection

A total of 300 subjects were used for the study. 150 were males, 150 were females, all of which were normal subjects. Subjects were selected and identified based on an oral interview.

### Place of Study and Duration

The study was done at Madonna University Elele Campus from May 3, 2017 – December 2, 2017.

### Sampling Method

These subjects were selected through purposive convenient sampling method.

### Inclusion Criteria

Subjects included in this study were those without inflammation or pathological changes on their lips or known allergy to lip stick used; and subjects who also were Igbos by both parents and genealogies; and had not gone through any craniofacial surgical procedure.

### Exclusion Criteria

Those who had inflammation or pathological changes or cleft on their lips, those known to have allergy to lip stick used and none Igbos indigenes were exempted from the study.

### Ethical Clearance

Ethical clearance was obtained from Madonna University Ethics Committee.

### Method of Data Collection

To identify the lip prints, lip stick method was used. The lips of the subject were first cleaned

thoroughly to remove any dirt that could interrupt with lip print pattern.

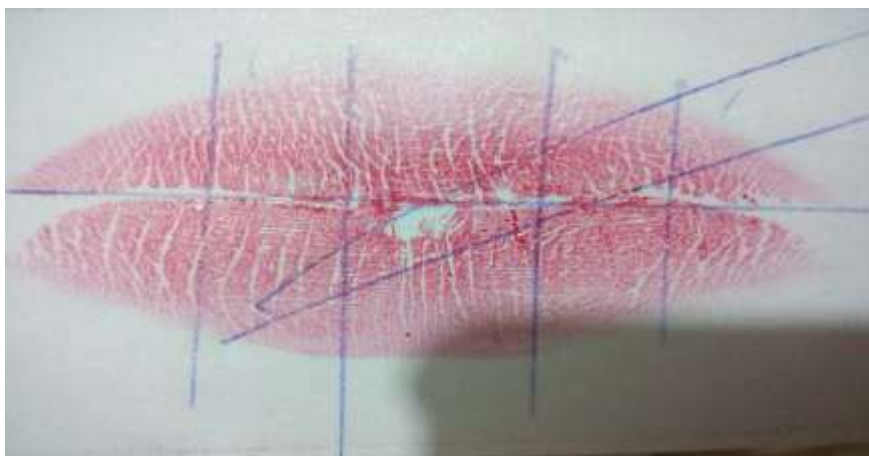
The lipstick was applied on subjects lip in a single motion, evenly on the lips. The subject was asked to gently rub his/her lips together to spread the lipstick evenly. A strip of cellophane tape, ten cm long was cut with scissors. The subject was asked to relax their lips without any constraint, keep the mouth stationary and closed during the procedure.

The glued portion of the cellophane tape was applied on the upper and lower lip together. It was held in place, applying gentle and even pressure for a few seconds. Then the tape was carefully lifted from the lips, from one end to the other, avoiding any smudging of the print. The strip of cellophane tape was attached to a piece of white A4 paper. This served as a permanent record [13]. The subjects' age, sex and origin were written above the prints to serve as a record.

Before the lip stick was used for the next subject, cotton wool was dipped into methylated spirit which was used to sanitize the lip sticks by rubbing it over the lip stick surface and on its sides.

For the analysis of the prints, the prints were divided into ten compartments for both lower and upper lip for perfect estimation [35, 36, 5].

In order to classify the lip prints, the classification proposed by Suzuki and Tsuchihashi was used. Type I – Complete vertical, Type I' - Incomplete vertical pattern, Type II- Branching or 'Y' pattern, Type III- Criss-cross pattern, Type IV- Reticular pattern and Type V- all other patterns [27].



**Fig-2: compartmentalization of Lip Prints**

Keys: Upper Left Lateral (ULL) Compartment, Upper Left Medial (ULM) Compartment, Upper Median (UM) Compartment, Upper Right Medial (URM) Compartment, Upper Right Lateral (URL) Compartment, Lower Right Lateral (LRL) Compartment, Lower Right Medial (LRM) Compartment, Lower Median (LM) Compartment, Lower Left Medial (LLM) Compartment, Lower Left Lateral (LLL) Compartment.

**STATISTICAL ANALYSIS**

Statistical Package for the Social Sciences (SPSS IBM® ver. 23.0) and MS Excel were used to analyze the data obtained. Frequency distribution and percentage was used to present the distribution of lip print patterns of the subjects, while Chi-square (X<sup>2</sup>) analysis was done to determine sex based differences. Significance level was set at 95% confidence interval, hence P< 0.05 was considered significant.

**RESULTS**

The results obtained from the study were tabulated below:

In table 1 the males and females had their highest percentage distribution in type I (35.73%) and (30.53%) respectively; the least percentage was in type IV (9.33 %) for the males and type I' (7.80%) for the females.

**Table-1: The distribution of Lip Print Pattern (types) among the Igbo subjects**

Sex	Type I (%)	Type I' (%)	Type II (%)	Type III (%)	Type IV (%)	Type V (%)
Males	35.73	10.07	22.73	11.87	9.33	10.27
Females	30.53	7.80	25.07	9.13	16.20	11.27
Total	33.13	8.93	23.90	10.50	12.77	10.77

In table 2 males had the highest upper lip distribution of type I, I' while the females had the highest distribution of type II, IV and V. In the lower

lip distribution, the males had higher distribution of type I' and type III, while the females had the higher distribution of type I, II, IV and V.

**Table-2: Lip Print pattern Distribution in the Upper and lower lip segments according to Sex**

Lip Segment	Sex	Type I	Type I'	Type II	Type III	Type IV	Type V	X <sup>2</sup>	P-value
Upper Lip	Male	272	91	99	78	91	119	61.01	<0.01**
	Female	179	65	112	78	193	123		
Lower Lip	Male	264	60	242	100	49	35	14.02	0.02**
	Female	279	52	264	59	50	46		

X<sup>2</sup>= Chi-square, P-value = Probability Value, df= 5

In table 3, Sex based differences in Lip Print Pattern was established, Significant differences were found in the following compartments [(URL) X<sup>2</sup> = 34.48, P< 0.01; (LRL) X<sup>2</sup> = 4.95, P<0.01; (URM) X<sup>2</sup> =42.79, P< 0.01; (LRM) X<sup>2</sup> = 4.37, P< 0.01; (ULM) X<sup>2</sup> = 19.23, P< 0.01; (LLM) X<sup>2</sup> =14.97, P< 0.01; (ULL) X<sup>2</sup> = 23.00, P< 0.01)] using Chi-Square test, except the following compartments [(LRM) X<sup>2</sup> =4.37, P< 0.50; (UM) X<sup>2</sup> = 10.61, P< 0.06 ; (LM) X<sup>2</sup> = 5.09, P< 0.40 and (LLL) X<sup>2</sup> = 6.80, P< 0.24)] that was not significant at P< 0.05.

**DISCUSSIONS**

In this study, the percentage distribution of the lip patterns have shown that in both sexes the type I was most prevalent. This could be a result of genetic interplay at the formative stage of the patterns where the genes controlling the formation and manifestation of type I was dominant over all other types in both sexes. This result is in conformity with several studies by other authors [13-18, 23] but fails to agree with works of Adamu *et al.* [5] who reported that Type V was predominant, followed by Type III, Type IV, Type I, Type II and least frequent was Type I'.

Again, a close look at the distribution of the patterns suggests sexual dimorphism in the way some patterns are distributed in both sexes. Take for instance, the distribution of types (I, I', III) which

were more frequent in the males than the females which tells to a certain extent that there is sexual dimorphism in their distribution. It further implies that aside from genetic interplay, there could be hormonal interference in the distribution of these pattern types with testosterone in favour of types (I, I', III). On another hand, the types (II, IV & V) were inclined towards the feminine distribution with higher frequency over the males. It further strengthens the manifestation of sexual dimorphism in these patterns, where oestrogen and progesterone were implicated to have influenced the distribution of the types (II, IV & V). This result negates the reports of previous authors who did not report sexual dimorphism in their study [2, 4, 13, 20, 21, 22, 24, 26, 34].

The results of the study again pointed out that the distribution of these pattern types according to upper and lower segments also expressed what may be seen as sexual dimorphism. In the upper segment, the males had a higher frequency distribution of the types (I, I') which depicts sexual dimorphism in the distribution. In addition, the distribution of type II, IV & V was higher in the females than males. This result also do not agree with the findings reported by Ishaq *et al.* [28] and the study of Rubio and Villalain as mentioned by Augustine *et al.* [30] who did not find significant differences in lip prints based on sex.

**Table-3: Sex differences in Lip Print Pattern among the male and female Igbo subjects using Chi-square (df = 5)**

Lip Segment	Sex	Type I	Type I'	Type II	Type III	Type IV	Type V	X <sup>2</sup>	P-value
URL	M	76	14	18	8	2	32	34.48	<0.01**
	F	41	10	43	17	14	25		
LRL	M	35	7	79	19	1	9	4.95	<0.01**
	F	39	6	89	11	1	4		
URM	M	54	17	31	25	6	17	21.13	<0.01**
	F	25	20	21	18	43	23		
LRM	M	40	18	56	20	9	7	42.79	<0.01**
	F	49	15	45	17	12	12		
UM	M	45	7	6	12	62	18	10.61	0.06
	F	51	6	5	2	75	11		
LM	M	100	11	6	4	24	5	5.09	0.40
	F	115	7	6	1	18	3		
ULM	M	42	29	21	17	20	21	19.23	<0.01**
	F	28	13	20	16	44	29		
LLM	M	47	16	37	28	14	8	14.97	0.01**
	F	39	18	42	12	16	23		
ULL	M	55	24	23	16	1	31	23.00	<0.01**
	F	34	16	23	25	17	35		
LLL	M	42	8	64	29	1	6	6.80	0.24
	F	37	6	82	18	3	4		

X<sup>2</sup>= Chi-square, P-value = Probability Value, URL = Upper right lateral, URM = Upper right medial, UM = Upper median, ULM = Upper left medial, ULL = Upper left lateral, LRL =Lower right lateral, LRM: Lower right medial, LM = Lower median, LLM = Lower left medial, LLL = Lower Left lateral, \*\* = Significant.

Considering the pattern distributions at the lower lip segment, the males had more distributions of type I', III while the females had type I, II, IV & V. These variations in the frequency of distribution reaffirm the occurrence of sexual dimorphism in the pattern distribution. Another reason that could account for dimorphism in the distribution of the patterns is the differences in ethnic groups, sample size and location of study as some other authors did not report sexual dimorphism in their population which may mean that it doesn't occur in all populations.

This present study also proved that cheiloscopy holds the potential to identify ethnicity, sexual dimorphism and personal identification.

**CONCLUSION**

In conclusion this study has been able to establish the cheiloscopic patterns for the Igbo ethnic group in Nigeria. The dominant pattern of the population was type I followed by type II and the least was type I'. It also revealed sexual dimorphism in the patterns and frequency of distribution of lip prints.

This reaffirms that lip prints pattern are reliable in studying population peculiarity.

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