PalArch's Journal of Archaeology of Egypt / Egyptology

PHOTOGRAPHIC STUDY OF LIP ANTHROPOMETRIC PATTERN AMONG IKA SUBJECTS FROM DELTA STATE IN NIGERIA

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Anibor E. , Photographic Study Of Lip Anthropometric Pattern Among Ika Subjects From Delta State In Nigeria , Palarch's Journal Of Archaeology Of Egypt/Egyptology 18(8), 2931-2938. ISSN 1567-214x.

Key words— Photographic, Lip, Anthropometric, Pattern.

Abstract:

Anthropometric parameters vary with maturity, gender, ecological setting and ethnicity, thus, anthropometry of populace by age and sexual category ought to be carried out discretely. The endeavor of this academic work is to evaluate the anthropometric parameters of the lips among Ika subjects from Delta State in Nigeria. This academic exercise involved anthropometry of lips in 100 Ikas aged 17-30 years in Delta State, Nigeria. These persons had no lip inflammation, herpes, malformations like cleft lip, and facial surgery. Full-face photos were taken with digital camera (with 12.3 Mega Pixel Lens). Mouth width, width of philtrum, height of the total lip and the nose-lip distance were measured on computer by corel draw software. Data were evaluated statistically using SPSS, independent sample t test and ANOVA. The width of the mouth was the uppermost mean as male dimension of 5.25± 0.683cm and female measurement of 5.23±0.655cm were jotted. The least measurement occurred with nose-lip (distance between sub nasale and labial superius); with male mean as 1.31±0.457cm and female mean as 1.31± 0.371cm. There was considerable association of age with the lip height ($p<.05$). This scrutiny has established baseline records on lip anthropometric parameters among Ika subjects from Delta State in Nigeria. Sexual category distinction in the lip anthopometric pattern of the Ikas was not outstanding, save for the philtrum width that portrayed significant gender disproportion. There is notable age disparity in lip height amid the Ika folks who hail from Delta State in Nigeria.

Introduction:

Ecology, diet, racial tie, maturity and sexual characteristics influence bulkiness and body proportions. Thus one cannot generalize anthropometry in diverse racial, national and tribal sets together [1]. Investigations of anthropometric distinctiveness and genetic patterns of lips in dissimilar ages provide criteria useful in surgical repair of lip abnormalities. Knowledge of anthropometric variations in the lips of diverse ages is vital in treatment planning and surgery; also it may well be effectual in expectancy of desired outcome in the field of surgery. In orthognathic surgery, it is crucial to get patent standards meant for soft tissues like the lips. Furthermore the scrutiny of lip morphological patterns is imperative in biological anthropology. Anthropometric variables differ with gender, age, ecological locality and individual traits are dissimilar, thus anthropometric investigations have to be prepared discretely for every population with regard to gender, age and race [2].
In Nigeria, few anthropometric researches on ethnic distinctiveness of lip proportions subsist; hence the endeavor of this academic work is to evaluate the anthropometric parameters of the lips amid the Ikas in Delta State, Nigeria. The striking relationship concerning the lip dimensions recorded and age makes this investigation of essence in anthropology, penology, medical jurisprudence and surgical practice.

Materials and Methods:

Materials and equipment:

Digital Camera with 12.3 mega pixel lens, data sheet, ruler and programs specifically Corel draw and Statistical Package for the Social Sciences (SPSS version 23) were utilized.

Sample:

Ika is an ethnic group in Delta State, Nigeria that is situated in Ika South and Ika North East Local Government Areas. Both localities have several villages but this study focused on the Ika North East specifically Agbor, which is densely populated with both indigenes and non-indigenes. Precisely 100 people aged between 17-30 years who were indigenes of Ika ethnic set were scrutinized. The subjects were grouped into distinct age brackets: the gap is 2 years (17-18, 19-20, 21-22, 23-24, 25-26, 27-28, 29-30years).

Methodology:

Cluster sample was employed and full-face photographs were captured in the month of December, 2020. Subjects were told to sit and stare at an outlying route without gesture (smile or scowl). The photos were taken in NHP (Natural Head Position). The NHP is the archetypal stance of the normal head position with high repeatability. Subsequent to transfer of photographs to a laptop, anthropometric landmarks on the lips were punctuated with Corel draw software. Thereafter measurement of lip anthropometric parameters on the face was done with the Corel draw software.
The landmarks employed to determine the lip proportions are as declared by Sforza et al., 2010 [3]:

- Cheilion (ch): spot at the angles of the lips.
- Cph (crista philtri) is a spot on the prominent point of philtrum sited on upper lip line border.
- Vermelion of upper lip (the boundary between the lip and skin mucus with extent between the angles of the lip).
- Stomion (sto) is a conjectural spot that is positioned at the junction of horizontal and vertical fissure and midline of labial lips, whilst the teeth are usually on each other.

- Labial superius (Ls): is midpoint of the superior vermelion line.
- Labial inferius (Li): is a midpoint, of the inferior vermelion line.
- Sn (sub nasale): the intersection point of the margin of the upper lip and nasal septum.

Specifically, the dimensions calculated are: mouth width (ch-ch); philtrum width (cph-cph); lip height (ls-li); the distance between the lip and nose (nose-lip distance) (sn-ls).
Subsequently, the statistics were subjected to analysis via SPSS software. Independent sample t test and ANOVA tests were utilized as inferential statistical tools in the process of data analysis. Tables were utilized for illustration of the outcomes and the diverse lip proportions observed at dissimilar ages and gender were noted.

Results:

Table 1: **Descriptive statistics of gender alongside the lip proportions**

	Gender	N	Mean (cm)	Standard Deviation (cm)	Standard Error of Mean
Mouth width	Male	47	5.25	.68284	.09960
	Female	53	5.24	.65488	.08996
Philtrum width	Male	47	1.81	.41476	.06050
	Female	53	1.84	.33674	.04625
Lip height	Male	47	2.72	.66853	.09752
	Female	53	2.74	.60319	.08285
Nose-lip distance	Male	47	1.32	.45679	.06663
	Female	53	1.31	.37050	.05089

Table 1 divulged that mouth width displayed the maximum mean; male dimension is 5.25± 0.683cm and female parameter is 5.24±0.655cm. The least measurement was the nose-lip distance; with male mean of 1.32±0.457cm and female mean of 1.31± 0.371cm.

Table 2 disclosed that there is no remarkable association between lip proportions and gender with exception of philtrum width which portrayed significant gender disproportion.

Table 2; **Relationship between the gender and characteristics of the lips among the Ikas**

		Independent Samples Test								
		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Mouth width	Equal variances assumed	.074	.786	.099	98	.921	.01328	.13387	-.25238	.27895
	Equal variances not assumed			.099	95.462	.921	.01328	.13421	-.25314	.27971

Philtrum width	Equal variances assumed	4.496	.036	-.484	98	.630	-.03640	.07521	-.18565	.11286
	Equal variances not assumed			-.478	88.688	.634	-.03640	.07615	-.18772	.11493
Lip height	Equal variances assumed	1.312	.255	-.136	98	.892	-.01723	.12717	-.26960	.23513
	Equal variances not assumed			-.135	93.352	.893	-.01723	.12796	-.27133	.23686
Nose-lip distance	Equal variances assumed	.589	.444	.060	98	.953	.00494	.08280	-.15937	.16926
	Equal variances not assumed			.059	88.641	.953	.00494	.08384	-.16166	.17154

Table 3; Descriptive statistics of the lip dimensions among the age brackets

Age (years)		Mouth width	Philtrum width	Lip height	Nose-lip distance
17-18	Mean	5.3000	1.8483	2.8500	1.3167
	Number	6	6	6	6
	Standard deviation	.81095	.28646	.69691	.61207
	Maximum	6.50	2.11	3.56	2.42
	Minimum	4.46	1.50	2.00	.62
19-20	Mean	5.4465	1.9475	3.0365	1.4040
	Number	20	20	20	20
	Standard deviation	.67613	.35946	.69012	.37989
	Maximum	6.50	2.66	4.46	2.31
	Minimum	4.19	1.28	1.76	.87
21-22	Mean	5.2031	1.8525	2.6244	1.2706
	Number	16	16	16	16
	Standard deviation	.54635	.27958	.62958	.33577
	Maximum	6.31	2.30	4.32	2.42
	Minimum	4.26	1.35	1.75	.98
23-24	Mean	5.2953	1.8069	2.7225	1.3453
	Number	32	32	32	32
	Standard deviation	.62554	.42983	.52388	.45028
	Maximum	6.78	2.81	3.81	2.82
	Minimum	4.00	1.00	1.75	.82
25-26	Mean	5.3623	1.9000	2.8931	1.3215
	Number	13	13	13	13
	Standard deviation	.59435	.36368	.42433	.49968
	Maximum	6.50	2.40	3.56	2.34
	Minimum	4.46	1.21	2.40	.89
27-28	Mean	4.8182	1.6209	2.2855	1.1318
	Number	11	11	11	11
	Standard deviation	.74877	.35036	.69345	.22346
	Maximum	6.23	2.04	3.45	1.51
	Minimum	3.77	1.00	1.63	.65
29-30	Mean	4.1950	1.3750	1.7500	1.1400
	Number	2	2	2	2
	Standard deviation	.00707	.03536	.00000	.00000
	Maximum	4.20	1.40	1.75	1.14

	Minimum	4.19	1.35	1.75	1.14
	Mean	5.2453	1.8278	2.7319	1.3127
	Number	100	100	100	100
Total lip area	Standard deviation	.66480	.37393	.63154	.41117
	Maximum	6.78	2.81	4.46	2.82
	Minimum	3.77	1.00	1.63	.62

Table 3 divulged age-related variations in mouth width which was striking.

Table 4; Relationship between the lip proportions and age

			Sum of Squares	df	Mean Square	F	Sig.
Mouth width * age	Between Groups	(Combined)	5.327	6	.888	2.149	.055
	Within Groups		38.427	93	.413		
	Total		43.754	99			
Philtrum width * age	Between Groups	(Combined)	1.262	6	.210	1.554	.169
	Within Groups		12.581	93	.135		
	Total		13.843	99			
Lip height * age	Between Groups	(Combined)	6.586	6	1.098	3.103	.008
	Within Groups		32.900	93	.354		
	Total		39.486	99			
Nose lip * age	Between Groups	(Combined)	.650	6	.108	.626	.709
	Within Groups		16.087	93	.173		
	Total		16.737	99			

Table 4 divulged that there is consequential age variation in lip height.

Discussion:

The main esthetic feature of the facial inferior one third is the lips [4]. A deep consideration of relationships between facial structures would allow individuals to be better diagnosed and treated [5]. Various factors namely maturity, sexual category, ethnic set, economic status, climate and region, affect lip proportions [6]. The bulkiness and curvature of the bare red lip surface differ with individuality, sex and ethnicity [7].

The size and shape of the lips differ in diverse ethnic sets and portray marked diversity [8]. Researchers divulged that thin lips are seen among European Caucasians, thick or very thick lips are seen among black people and combinational lips are typical among Orientals [9]. The endeavor of this academic work was to evaluate the anthropometry of the lips among Ika subjects in Nigeria. The author recorded the lip anthropometric patterns and noted the gender peculiarity in the lip dimensions among subjects between 17-30 years who hail from Ika ethnic set in Nigeria.

Table 1 divulged that the mean mouth width is 5.24± 0.668cm and the lip-nose distance divulged average proportion of 1.31±0.413cm. Philtrum width portrayed a mean value of 1.82±0.380cm. The average distance of lip to nose in this study is larger than the value

recorded by Abrishami et al., in 2014 as they noted mean distance of lip to nose as 0.074±1.530 mm [8]. Farahvash et al., (2011) reported that mean mouth width of Iranian men is 4.59±4.2cm which does not concur with this inquiry [10]. The current scrutiny differed from that of Farkas and his colleagues who analyzed the width of the philtrum (sn-ls) of 18-25 year-old women and men in North America and reported that it is 1.67cm. They documented mean philtrum width in Persian individuals as 1.530±0.074cm a lesser value than the dimension of whites in North America [11]. Azami and his contemporaries determined mouth width equal to 3.96cm at Iran in the year 2011 [12]. Abrishami et al., found out that the mean mouth width is equal to 4.07cm [8].

Table 1 divulged that the mouth width has the highest mean with the male dimension of 5.25± 0.683cm and the female parameter of 5.23±0.655cm. The least measurement was that of the distance between sub nasale and labial superius; with male average of 1.31±0.457cm and female average of 1.31± 0.371cm. Researchers measured the mouth width of the 51 males and 117 females in 2013. These people were Arabians from the Middle East, Bahrain, Saudi Arabia and Kuwait. The mean value of mouth width was 5.29cm in the males. The mean was 5.36cm in Bahraini men, 5.26cm in Saudi Arabian men and 5.25cm in Kuwaiti males. The mouth width in Europe is 5.50, 5.00 in Turkey and 4.68 in Northern India [13]. Emelike et al., investigated 100 males and 100 women from the Igbo population in Nigeria. Findings showed that the width of the mouth in the male population living in Igboland is 5.37±0.52 cm [14]. Researchers reported the average of mouth width of adult Chinese men (6.5 cm), Caucasians (3.6 cm) and Blacks (2.7 cm). In all of these populaces males had different width of mouth comparing with current inquiry [10].

Table 2 disclosed that there is no significant relationship between most of the lip variables and gender with exception of philtrum width which portrayed significant gender disproportion. The male has higher variables and this was strongly in agreement with Emelike et al., (2012) who stated that males show higher lip dimension values than females [13]. Nepalese and Indian Researchers also stated that the male portray a higher value of philtrum width than the female [15,16].

Table 3 divulged age-related variations in lip dimensions with the width of the mouth portraying striking age variation. This inquiry is in contrast with a study carried out by Heidari et al., (2014) that reported no difference in the higher, lower and overall vermilion region between two races [17]. The investigation of Sforza et al., (2010) illustrated that dissimilar lip regions show various patterns of growth. The entire lip doesn't grow with a laid down prototype with age, rather some parts grow more rapidly and some others grow less rapidly [3].

Table 4 disclosed a considerable association between the lip height and age. Abrishami et al., in 2014, noted a notable association between age and mouth width parameters, nose-to-nose lip height and total lip area. They saw a considerable correlation between age and philtrum width [8]. This scrutiny, in accordance with the researches of Sforza et al, and Abrishami et al., verified that dissimilar lip regions display diverse rates of growth. This means that diverse lip regions don't develop with similar growth patterns at varied age range [3,8].

In this study the philtrum width is 1.83 cm±0.353 cm. Abrishami et al., in 2014 recorded philtrum width of 1.26±0.280 cm [8]. Different values were recorded for Indian men (1.30 cm), Chinese (1.20 cm), Caucasians (1.50 cm) and Blacks (1.20 cm) [10].

The studies discussed above divulged similarities and dissimilarities in the lip anthropometric patterns. The variations highlighted in the anthropometric analysis of lips from the studies appraised are due to methodology, racial features, nationality, ethnic factors, age and gender characteristics.

Conclusion:

This scrutiny has established baseline information on anthropometric measurements of the lips among Ika subjects in Nigeria. Sexual category distinction in lip anthopometric pattern of the Ikas was not outstanding, save for width of the philtrum that portrayed significant gender disproportion. There is remarkable age disparity in lip height amid Ika folks who hail from Delta State in Nigeria.

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