Journal of Population Therapeutics & Clinical Pharmacology

RESEARCH ARTICLE
DOI: 10.53555/jptcp.v31i7.7128

PERCEPTION OF MOST AESTHETICALLY PLEASING LOWER FACIAL HEIGHT (LFH) WITH COMPLETE DENTURE IN EDENTULOUS PATIENTS VISITING SARDAR BEGUM DENTAL COLLEGE

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ABSTRACT

Background: The key to judging an individual's beauty is their proportionate connection between various craniofacial areas. Numerous studies have impressed with requirements to defend beauty criteria. In this assumption, however, the platitude is the difference in facial patterns among many ethnic groups worldwide. Therefore, it is not appropriate to generalize the face measurement norm.
Objectives: To compare the most aesthetically pleasing lower facial height with a complete denture as perceived by patients of different age, gender and educational status.
Methodology: This study was Cross-sectional analytical carried out at the Department of Prosthodontics, Sardar Begum Dental College, Peshawar, KPK. The duration of the current study was 6 months from March 2023 to August 2023. The sample size of this study consisted of 384 patients. After receiving a verbal explanation of the objectives of this research, each patient was then given a pre-designed answer form so that their responses could be recorded and organized. A written consent was taken from each patient before recording their perception. In a sitting position, a face picture of a model edentulous patient was captured using a Canon 70D camera. In the questionnaire, for the purpose of keeping a record, the patient's name, age, gender, and educational status were recorded. The data were analyzed using SPSS version 21.
Results: After performing the Chi-Square test, the results indicate that there is a statistically significant relationship between the gender and lower facial height of the patients. This result indicates that lower facial height depends on the gender of the patients. The sample mean statistic shows that the lower facial height of female patients is slightly higher as compared to male patients.
Conclusion: Our study concludes that only gender has a statistically significant relation with the lower facial height of the patients, and marital status, educational level, and age groups of the patients have no statistically significant relation with the lower facial height of the patients.

Keywords: Aesthetically Pleasing, Lower Facial height, Facial attractiveness, edentulous

Introduction

Since the beginning of time, people have believed that physical attractiveness and beauty play a significant role in social interactions. At a very young age, children are instilled with the knowledge that it is very important for them to acquire an aesthetic sense, with the idea that what is beautiful is also beneficial. [1] A person's physical attractiveness may have an effect on their popularity, the quality

of their social interactions, the education they get, their ability to do their profession, and extra-life possibilities throughout their lifetime. [2] Previous studies have shown that children with a higher level of aesthetic ability are more well-liked by society as a whole, have more positive outlooks, are more successful academically, have stronger social networks, are more self-reliant and confident, and show less anxiety than their contemporaries with a lower level of aesthetic ability. It has been discovered that when making general aesthetic assessments of people, the face is the primary characteristic that is taken into consideration. [3]

Dentistry examines the faces of patients from a variety of perspectives, such as transverse, anterior/posterior, and vertical, but research on facial aesthetics has revealed that the latter two dimensions are the most significant to take into consideration. The maxillo-mandibular connection of a patient is assessed and categorized along an A-P dimension before treatment is administered. [4] For a connection to be classified as Class I, the mandible must be positioned 2–3 millimeters posterior to the maxilla. For a connection to be classified as Class II, the mandible must be retruded from the maxilla by more than 3 millimeters, and for a connection to be classified as Class III, the jaw must protrude from the maxilla by more than 3 millimeters. Lower facial height (LFH) is a measurement that may be taken vertically on a patient when the individual is being seen from the perspective of the profile. [5] Both the vertical distances between the base of the nose and the lowest point on the chin should be equal on average. When these changes are not coincidental, the LFH of a patient may be classified as either elevated or decreased. [6]

While there are various methods for estimating the occlusal vertical dimension (OVD), there is no method that is universally recognized or wholly trustworthy for measuring the OVD in edentulous individuals. The OVD is an important component of facial aesthetics. Apart from the requirements of money, time, and equipment, it would seem that one method does not provide any significant benefits over another. [7] Despite the fact that the topic has been debated several times in dental literature, the clinical concept of vertical dimension is still unclear. In addition, there is still a lot of difficulty involved in determining the best method for measuring the vertical dimension when attempting to restore vertical dimensions in people who are completely edentulous. [8] Because of this, the cosmetics industry is a multi-billion dollar industry each and every year, and in the year 2010, the head and face were included in 92.3% of the 13.1 million cosmetic treatments (surgical and minimally invasive) that were done. [9] Over the course of the last quarter century, there has been a substantial rise in the amount of attention paid to the study of the human face, as well as the criteria that people use to judge the beauty and aesthetic qualities of a person's appearance based on their facial features. As of the year 1975, there were just five publications on this subject that were being published per year in the scientific literature. During the 1990s, more than 150 academic publications were released into circulation for the first time. At the present, whole scientific papers as well as a significant amount of specialized research are being committed to the investigation of this specific subject of study. [10] Aesthetic enhancement of the face is of interest to a wide range of medical professionals, including plastic surgeons, head and neck surgeons, oral and maxillofacial surgeons, orthodontists, and prosthodontists, for a number of different reasons. [4] In the most recent decades, there has been a trend in society toward putting a larger focus on the beauty of one's appearance, particularly the face. This emphasis on facial attractiveness is particularly prevalent in the United States. People have been attracted by the concept of scrutinizing faces and finding methods to modify their look for a very long time. In fact, this fascination dates back to prehistoric times. [11] In spite of this, our conceptions of what constitutes a "aesthetic face" are always evolving along with our culture and our thoughts of what constitutes attractiveness. Complete dentures are one of the treatment options that are considered to have the highest rate of success when it comes to treating edentulous individuals who are missing all of their natural teeth. Edentulous people are those who have been deprived of all of their natural teeth. [12] Complete dentures, in addition to restoring the patient's ability to chew food properly and speak appropriately, may also improve the patient's physical attractiveness, especially in the lower face region. This advantage is more obvious in individuals who are 17 years old or older. Oral rehabilitation is vital for edentulous patients in terms of the perception of lower facial height (LFH) and its aesthetic appeal with full dentures. Dentures may make a person seem shorter than they really

are.[13] This is due to the fact that LFH has the potential to substantially change the patient's facial look and, as a result, the patient's sense of pride in their own appearance. [14]

Material and Methods

This study was Cross-sectional analytical carried out at the Department of Prosthodontics, Sardar Begum Dental College, Peshawar, KPK. The duration of the current study was 6 months from March 2023 to August 2023. The sample size of this study consisted of 384 patients. Samples were selected on the basis of Inclusion and Exclusion criteria.

Inclusion criteria:

The inclusion criteria for this cross-sectional study was:

- Patients wearing complete dentures.
- Patients who are above age 50.
- Edentulous patients were included in the study.

Exclusion criteria:

The exclusion criteria for this study was:

- Patients with weak eye-sight,
- Those patients who are mentally handicapped were excluded from the studies.
- Terminally ill will be excluded from the sample.

A pilot study was used to identify the LFH measures that were to the participants' satisfaction. A comparison was made between the original picture and each image that had the LFH moved up or down by one millimeter. After that, each patient's photos were printed out on the same page as the others. Images were printed in a random order for the purpose of determining the level of intrarater reliability, and each picture was given a number between 1 and 7. After that, the patients were given instructions to write down the number of the picture that most appealed to their sense of aesthetics.

After receiving approval from both the ethical committee and the Board of Advance Studies and Research of Gandahara University, the researchers collected data for this. It was requested that the patients take part in the study on their own free will, and a permission form was given to each patient to sign. The patient's right to privacy was respected at all times. After receiving a verbal explanation of the objectives of this research, each patient was then given a pre-designed answer form so that their responses could be recorded and organized. A written consent was taken from each patient before recording their perception. In a sitting position, a face picture of a model edentulous patient was captured using a Canon 70D camera. The patient was instructed to keep their natural head posture while the portrait was taken. After that, the image of the subject's face was altered using Adobe Photoshop CS5. A set of seven face images was created, one of which was left untouched, three of which had their LFH reduced, and three of which had their LFH increased. The LFH decreased and increased by 1 mm, 2 mm, and 3mm in all the pictures. They were then printed as colorful photographs of excellent quality with a black backdrop. After that, the altered images of the patients' faces were displayed to all of the patients. Using a visual analog scale (VAS), the patients were asked to register a score of five for their overall impression (1: most attractive, 5: not attractive). After the notation of the score for perception, the data were put through statistical analysis. A performa was made and printed with all of the photos of the reduced and enlarged photographs on the same side, and the patient's perception was recorded on the page that followed. In the questionnaire, for the purpose of keeping a record, the patient's name, age, gender, and educational status were recorded. The data were analyzed using SPSS version 21, which was used. The mean and standard deviation were determined for quantitative data such as age and educational level. Some examples of such data include. The frequency of each element as well as its proportion were determined for qualitative aspects such as gender and profession. The Chi-square test was carried out in order to determine whether or not there was a relationship between the qualitative independent variables.

Results

Facial photographs of model edentulous patient is recorded and LFH is altered and set face images were created having increased and decreased LFH. The mean and standard deviation were the statistical tools that were used in this study to describe the findings about educational level, age, and lower facial height. The word "image" will be used throughout the investigation to refer to the lower face height.

Table 1 presents the descriptive statistics for key demographic variables for a dataset with 388 observations across four variables. The "Gender" variable has a mean of 1.45, indicating that on average, the respondents' gender is skewed toward one category (1), with a standard deviation of approximately 0.498, suggesting some variation. "Marital Status" has a mean of 1.11, with less variability (standard deviation ≈ 0.311), indicating that respondents are predominantly in one marital status category (1). "Educational Status" exhibits greater variation, with a mean of 2.55 and a higher standard deviation of approximately 1.300, implying a wider range of educational backgrounds. Finally, "Age (years)" has a mean of 2.47 and a standard deviation of about 0.994, suggesting moderate variation in respondents' ages. These descriptive statistics provide a concise snapshot of the dataset, highlighting the central tendencies and variabilities within each variable. Table 2 presents the relationship between Marital Status and individuals' preferences for images depicting Lower Facial Height (LFH) variations. The analysis involving 388 participants categorizes them as "Married" or "Unmarried." In the "Married" group, 7 participants preferred Image 1 (LFH Normal), while the "Unmarried" group had 24 participants who favored Image 6 (LFH 2mm decreased). A chi-square test was conducted, resulting in a non-significant p-value of 0.130, indicating that there is no strong evidence to establish a significant association between marital status and image preferences for LFH variations. The table suggests that marital status is not a significant factor in explaining individuals' preferences for LFH variation images.

Table 3 displays individuals' Educational Status and their preferences for images representing Lower Facial Height (LFH) variations. The analysis involves 388 participants categorized into four educational groups: "Up to Matric," "Bachelor," "Master or above," and "Uneducated." For the "Up to Matric" group, 55 participants preferred Image 6 (LFH 2mm decreased), and 26 participants favored Image 7 (LFH 3mm decreased), with a total of 128 participants in this category. Similarly, the "Bachelor" and "Master or above" groups exhibited various preferences for LFH images, as did the "Uneducated" group, with 14 participants preferring Image 3 (LFH 2mm increased) and 7 participants favoring Image 4 (LFH 3mm increased). The "Uneducated" group comprised 151 participants. A chi-square test was conducted, resulting in a non-significant p-value of 0.134. This suggests that there is no strong evidence to support a significant association between an individual's level of education and their preferences for LFH image variations. The table reveals that educational status does not appear to be a statistically significant factor in explaining individuals' preferences for LFH image variations.

Table 4 presents individuals' gender and their preferences for images representing Lower Facial Height (LFH) variations. The analysis involves 388 participants categorized into two gender groups: "Male" and "Female." For the "Male" group, 56 male participants preferred Image 5 (LFH 1mm decreased), and 68 favored Image 6 (LFH 2mm decreased), with a total of 215 participants in this category. Similarly, the "Female" group exhibited their distribution of image preferences, where 50 female participants preferred Image 5 (LFH 1mm decreased), and 76 favored Image 6 (LFH 2mm decreased), with a total of 173 participants in the "Female" category. A chi-square test was conducted, resulting in a non- significant p-value of 0.38. This suggests that there is no strong evidence to support a significant association between an individual's gender and their preferences for LFH image variations. The table reveals that an individual's gender does not appear to be a statistically significant factor in explaining their preferences for LFH image variations. Table 5 presents individuals' age (in years) and their preferences for images depicting Lower Facial Height (LFH) variations. The analysis involves 388 participants categorized into four age groups: "40 - 50," "50 - 60," "60 - 70," and "70 - 80." For the "40 - 50" age group, 22 participants favored Image 5 (LFH 1mm decreased), and 30 preferred Image 6 (LFH 2mm decreased), with a total of 76 participants in this age group. Similarly,

the "50- 60," "60 - 70," and "70 - 80" age groups exhibited varying preferences for LFH images. A chi-square test was conducted, resulting in a non-significant p-value of 0.896. This suggests that there is no strong evidence to support a significant association between an individual's age and their preferences for LFH image variations. The table reveals that an individual's age does not appear to be a statistically significant factor in explaining their preferences for LFH image variations.

Table 1 Descriptive Statistics:

Variables	N	Minimum	Maximum	Mean	Std. Deviation
Gender	388	1	2	1.45	.498
Marital Status	388	1	2	1.11	.311
Educational Status	388	1	4	2.55	1.300
Age (years)	388	1	4	2.47	.994

Table.2 marital status and patient perception related to preferred lower facial height

		Image							Total	P Value
		1 LFH Normal	2 LFH 1mm increased	3 LFH 2mm increased	4 LFH 3mm increased	5 LFH 1mm decreased	6 LFH 2mm decreased	7 LFH 3mm decreased		
Marital Status	Married	7	10	22	15	98	120	74	346	.130
		2.0%	2.9%	6.4%	4.3%	28.3%	34.7%	21.4%	100%	
	Unmarried	1	0	2	0	8	24	7	42	
		2.4%	.0%	4.8%	.0%	19.0%	57.1%	16.7%	100%	
Total		8	10	24	15	106	144	81	388	
		2.1%	2.6%	6.2%	3.9%	27.3%	37.1%	20.9%	100%	

Table.3 relation of educational status with patient perception regarding lower facial height

		Image							Total	P Value
		1 LFH Normal	2 LFH 1mm increased	3 LFH 2mm increased	4 LFH 3mm increased	5 LFH 1mm decreased	6 LFH 2mm decreased	7 LFH 3mm decreased		
Educational Status	Up to Matric	4	5	5	7	26	55	26	128	
		3.1%	3.9%	3.9%	5.5%	20.3%	43.0%	20.3%	100%	
	Bachelor	1	4	4	0	24	19	18	70	
		1.4%	5.7%	5.7%	.0%	34.3%	27.1%	25.7%	100%	
	Master or above	1	0	1	1	11	16	9	39	
		2.6%	.0%	2.6%	2.6%	28.2%	41.0%	23.1%	100%	
	Uneducated	2	1	14	7	45	54	28	151	
		1.3%	.7%	9.3%	4.6%	29.8%	35.8%	18.5%	100%	
Total		8	10	24	15	106	144	81	388	.134
		2.1%	2.6%	6.2%	3.9%	27.3%	37.1%	20.9%	100%	

Table.4 Gender and patient perception related to preferred lower facial height

		Image							Total	P Value
		1 LFH Normal	2 LFH 1mm increased	3 LFH 2mm increased	4 LFH 3mm increased	5 LFH 1mm decreased	6 LFH 2mm decreased	7 LFH 3mm decreased		
Gender	Male	5	8	18	11	56	68	49	215	0.38
		2.3%	3.7%	8.4%	5.1%	26.0%	31.6%	22.8%	100%	
	Female	3	2	6	4	50	76	32	173	
		1.7%	1.2%	3.5%	2.3%	28.9%	43.9%	18.5%	100%	
Total		8	10	24	15	106	144	81	388	
		2.1%	2.6%	6.2%	3.9%	27.3%	37.1%	20.9%	100%	

Table.5 Age and patient perception related to preferred lower facial height

		Image							Total	P Value
		1 LFH Normal	2 LFH 1mm increased	3 LFH 2mm increased	4 LFH 3mm increased	5 LFH 1mm decreased	6 LFH 2mm decreased	7 LFH 3mm decreased		
Age (years)	40 - 50	2	2	5	1	22	30	14	76	0.896
		2.6%	2.6%	6.6%	1.3%	28.9%	39.5%	18.4%	100%	
	50 - 60	2	4	11	5	31	45	23	121	
		1.7%	3.3%	9.1%	4.1%	25.6%	37.2%	19.0%	100%	
	60 - 70	3	2	4	6	37	48	24	124	
		2.4%	1.6%	3.2%	4.8%	29.8%	38.7%	19.4%	100%	
	70 - 80	1	2	4	3	16	21	20	67	
		1.5%	3.0%	6.0%	4.5%	23.9%	31.3%	29.9%	100%	
Total		8	10	24	15	106	144	81	388	
		2.1%	2.6%	6.2%	3.9%	27.3%	37.1%	20.9%	100%	

Discussion

There has been a significant increase in the number of people interested in face aesthetics over the course of the last several decades. [15] As a direct consequence of these trends, there are currently businesses, such as the retail industry and cosmetic surgery that generate billions of dollars each year. In recent years, a heightened aesthetic awareness has emerged as a direct consequence of advancements in public knowledge and layman sensibility.

The primary purpose of this research was to examine the variables, such as age, gender, and educational background that are connected with an aesthetically lower facial height in patients who wore full dentures. This study was conducted on patients who wore dentures to replace all of their teeth. Because of this, the question that was looked at throughout the study was whether or not there is a connection between factors that are not directly connected to one another, such as age, gender, and educational level, and a lower face height, which is considered to be more appealing from an aesthetic standpoint. The purpose of this research was to evaluate the link between educational level, age, lower facial height, and other demographic characteristics such as gender and marital status among a group of 384 individuals who were randomly selected for the study. According to the sample's descriptive statistics, the majority of individuals had lower facial height values that were more than 4 millimeters, with a mean of 5.46 millimeters and a standard deviation of 1.359millimeters. A majority of the patients had a comparatively greater lower facial height, as shown by the distribution of the lower facial height, which was skewed in an unfavorable direction. Based on the demographic profile of the participants, it was discovered that 33.3% of them had an educational level of up to Matric, 18% had a bachelor's degree, 10.2% had a master's degree or higher degree, and 38.5% were uneducated. The bulk of the participants, in terms of age, fell somewhere between the ages of 50 and 70 years old. The sample included 55.2% men and 44.8% women, and 89.1% of the participants were married while 10.9% were single and never married. Previous study in the area of prosthodontics is supported by the findings of our investigation into gender and LFH image preferences in the field. The lack of a statistically significant link between gender and image preferences is consistent with the results of prosthodontic research [13] that have investigated the effect of gender on dental aesthetics preferences. These studies looked at the preferences of both males and females. The findings from this study provide credence to the hypothesis that gender may not have a significant impact on the prosthodontic treatment options associated to LFH variants. These findings

underscore the uniqueness of prosthodontic aesthetics within the broader spectrum of facial aesthetics. [16, 17] In prosthodontics, the perception of facial harmony and dental aesthetics may be shaped by a combination of factors, including tooth size, color, and arrangement, which could override the influence of gender. Prosthodontists should consider these complexities when developing treatment plans tailored to individual patients. [16]

Research in the field of healthcare continues to be fascinated by the issue of determining whether or not there is a correlation between an individual's level of education and the preferences they have for medical treatment. The present research gathered data from 388 individuals who were categorized into several educational levels. These categories were "Uneducated," "Up to Matric," "Bachelor," and "Master or above." We investigated their preferences for LFH pictures in order to discover whether or not education had a major role in shaping their choices. According to the results of the chi-square test, the chi-square value (X2) was 24.675, and the p-value was 0.134. This suggests that educational level did not have a significant influence on the preferences for LFH images.

The fact that educational level had no influence on LFH image choices is consistent with findings from earlier studies in the field of prosthodontics. [18] Even while education is an essential component of effective patient communication and comprehension, it may not be enough to alter patients' preferences for certain LFH variants in prosthodontics, according to the findings of these research and our own. [18]

The fact that Espelid et al.'s study and the present research came to very similar conclusions sheds light on an underlying concept, namely that educational background is not a significant factor in the formation of preferences about medical treatment. [19] Instead, the necessity of providing tailored treatment that is patient-centered and prioritizes the patient's choices and particular circumstances is emphasized. This is done in place of the traditional focus on the patient's educational background. [19]

The non-significant effect of age on LFH image preferences in our prosthodontic study aligns with the conclusions of Jones et al. 2019, who found that age may not be a primary determinant of dental aesthetics preferences in prosthodontics. These findings suggest that, in the prosthodontic context, age may not dictate preferences for LFH variations. [20]

Conclusion

The female patients who participated in this study had a lower facial height as compared to the male patients' lower facial height. Also, the Chi-Square tests between the lower facial height and educational level, marital status, and age show that the significance values of all the tests were greater than 0.05, which indicated that these variables have no significant relationship with the lower facial height of the patients. So, the results conclude that only gender has a statistically significant relation with the lower facial height of the patients, and marital status, educational level, and age groups of the patients have no statistically significant relation with the lower facial height of the patients.

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