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RESEARCH ARTICLE

EFFECTIVENESS OF BERRY'S BIOMETRIC INDEX IN DETERMINING THE SIZE OF ANTERIOR TEETH IN SOUTH INDIAN POPULATION

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ABSTRACT

AIM : The aim for this study is to determine the effectiveness of Berry's Biometric Index (BBI) to measure the size of anterior teeth in South Indian population.
BACKGROUND: BBI is one of the method to measure the size of anterior tooth. It is measured by measuring the bi-zygomatic width of patient which is divided by 16. It can also be measured by measuring the length of the face divided with 20.
REASON: The best method to measure the size of anterior teeth is remain unknown. Hence, the best method to determine the size of anterior teeth need to be explore for future use.

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INTRODUCTION

Prosthesis is an artificial device that replaces the missing body part. In case of prosthodontics, the missing part would be the tooth. In order to replace the missing tooth, many methods and techniques were used to replace the missing tooth. J.W. White was the first person to came up with the "correspondence and harmony" concept in 1872. Tooth form and colour play an important role in this concept. The concept state that the proportion of tooth should correspond to the size of face. The colour of tooth should also correspond to the complexion of face. These two basis should be considered based on sex and age (Hasanreisoglu, 2005). The first accepted technique was the "Temperamental technic"upon selecting tooth form. This technique was not widely used until the year 1885 when the temperamental forms of teeth were manufactured as 'name set'. W.R. Hall came up with the concept which is "Typical form concept" in 1887 (Hall, 1887). He gave the first measurements of the typical tooth forms. The basis of this classification was the tooth's labial surface curvatures, outline form and neck width. He gave the form in classification of ovoid, tapering and square. The next technique is "Berry's biometric ratio method"which was introduced by Berry in 1906 (Berry, 1905).

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He proposed that the proportions of the upper central incisor tooth had a definite proportional ratio to face proportions. The tooth was one sixteenth of the face width and one twentieth the face length. Another method for tooth selection is Clapp's "Tabular Dimension Table Method," which was proposed around 1910. This method was based on selecting tooth size from the overall dimension of six anterior teeth and the vertical tooth space present in the patient (Clapp, 1922). Valderrama proposed "Molar Tooth Basis," in the year 1913 . The tooth size was measured on a one-fourth increment of the size of a Bonwill triangle, and is determined by measuring the edentulous mandible (Valderrama, 1920). "Wavrin Instrumental Guide Technique"was projected by William in the year 1920. It was a combination of Berry's Biometric ratio method and the William's typical form teeth (Wavrin, 1941).
The next method is"Anthropometric Cephalic Index Method," which was proposed by Sears in the year 1941. The circumference of head and bi-zygomatic width determines the size of tooth. The circumference of head is divided by 13 or by using the bi-zygomatic width divided by 3.3. The tooth length was said to be in proportion to the face (Sears, 1941). The Justi Company proposed the "Frame Harmony Method,"in the year 1949. This method states that the general proportions of the skeleton is in harmony with the size of teeth. The tooth size was determine by one-seventeeth of the total dimension of the upper and lower bearing areas (A manual for plastic teeth, 1949).

MATERIALS AND METHODS

The study was done by measuring the size of anterior tooth by measuring the bi-zygomatic width of patient which is divided by 16. It can also be measured by measuring the length of the face of patient divided with 20. The width and length of the finding is tabulated in a table. 100 patients were selected in which 50 patients are male and the remaining 50 patients are female. The bi-zygomatic width of patient is measured by using a vernier calliper and the length of face is measured by using measuring tape.

RESULTS

The result for the finding is put into a table below.

No.	Bizygomatic width/16	Length of face/20	Actual width
1.	10.0/16 = 0.63cm	14.0/20= 0.70cm	0.80cm
2.	9.4/16=0.59cm	13.1/20=0.66cm	0.70cm
3.	8.8/16=0.55cm	12.2/20=0.61cm	0.70cm
4.	9.9/16=0.62cm	13.0/20=0.65cm	0.70cm
5.	9.8/16=0.61cm	12.7/20=0.64cm	0.60cm
6.	9.0/16=0.56cm	13.0/20=0.65cm	0.60cm
7.	8.9/16=0.56cm	12.8/20=0.64cm	0.65cm
8.	9.1/16=0.57cm	13.1/20=0.66cm	0.70cm
9.	9.2/16=0.58cm	13.2/20=0.66cm	0.60cm
10.	8.8/16=0.55cm	12.8/20=0.64cm	0.70cm
11.	8.7/16=0.54cm	12.6/20=0.63cm	0.65cm
12.	9.3/16=0.58cm	13.2/20=0.66cm	0.70cm
13.	8.3/16=0.52cm	12.8/20=0.64cm	0.60cm
14.	8.5/16=0.53cm	12.7/20=0.64cm	0.60cm
15.	9.1/16=0.57cm	13.0/20=0.65cm	0.70cm
16.	9.0/16=0.56cm	13.1/20=0.66cm	0.70cm
17.	8.8/16=0.55cm	12.8/20=0.64cm	0.70cm
18.	9.9/16=0.62cm	13.4/20=0.67cm	0.70cm
19.	9.5/16=0.59cm	13.3/20=0.67cm	0.70cm
20.	8.1/16=0.51cm	12.6/20=0.63cm	0.65cm
21.	9.5/16=0.59cm	13.2/20=0.66cm	0.60cm
22.	8.8/16=0.55cm	12.5/20=0.63cm	0.60cm
23.	8.7/16=0.54cm	12.7/20=0.64cm	0.65cm
24.	8.5/16=0.53cm	12.3/20=0.62cm	0.65cm
25.	9.1/16=0.57cm	13.5/20=0.68cm	0.70cm
26.	9.2/16=0.58cm	13.0/20=0.65cm	0.70cm
27.	9.5/16=0.59cm	13.4/20=0.67cm	0.70cm
28.	8.0/16=0.50cm	12.4/20=0.62cm	0.60cm
29.	8.6/16=0.54cm	12.5/20=0.63cm	0.60cm
30.	8.4/16=0.53cm	12.6/20=0.63cm	0.65cm
31.	8.7/16=0.54cm	12.6/20=0.63cm	0.60cm
32.	9.0/16=0.56cm	13.2/20=0.66cm	0.70cm
33.	9.1/16=0.57cm	13.1/20=0.66cm	0.70cm
34.	9.5/16=0.59cm	13.4/20=0.67cm	0.70cm
35.	8.4/16=0.53cm	12.6/20=0.63cm	0.60cm
36.	8.3/16=0.52cm	12.6/20=0.63cm	0.65cm
37.	9.2/16=0.58cm	13.0/20=0.65cm	0.70cm
38.	9.5/16=0.59cm	13.2/20=0.66cm	0.70cm
39.	9.3/16=0.58cm	13.1/20=0.66cm	0.70cm
40.	8.8/16=0.55cm	12.5/20=0.63cm	0.65cm
41.	8.5/16=0.53cm	12.4/20=0.62cm	0.65cm
42.	8.7/16=0.54cm	12.5/20=0.63cm	0.60cm
43.	9.2/16=0.58cm	13.1/20=0.66cm	0.70cm
44.	8.7/16=0.54cm	12.6/20=0.63cm	0.70cm
45.	9.1/16=0.57cm	13.2/20=0.66cm	0.70cm
46.	9.2/16=0.58cm	13.2/20=0.66cm	0.70cm
47.	8.9/16=0.56cm	13.0/20=0.65cm	0.70cm
48.	8.6/16=0.54cm	12.8/20=0.64cm	0.65cm
49.	8.4/16=0.53cm	12.7/20=0.64cm	0.70cm
50.	8.3/16=0.52cm	12.5/20=0.63cm	0.60cm
51.	9.0/16=0.56cm	13.0/20=0.65cm	0.70cm
52.	9.2/16=0.58cm	13.1/20=0.66cm	0.65cm
53.	8.5/16=0.53cm	12.7/20=0.64cm	0.65cm
54.	8.8/16=0.55cm	12.6/20=0.63cm	0.65cm
55.	8.5/16=0.53cm	12.3/20=0.62cm	0.60cm
56.	8.9/16=0.56cm	12.8/20=0.64cm	0.60cm
57.	9.1/16=0.57cm	13.0/20=0.65cm	0.70cm
58.	9.2/16=0.58cm	13.1/20=0.66cm	0.70cm
59.	8.7/16=0.54cm	12.7/20=0.64cm	0.65cm
60.	8.8/16=0.55cm	12.7/20=0.64cm	0.65cm
61.	8.3/16=0.52cm	12.5/20=0.63cm	0.65cm
62.	8.8/16=0.55cm	12.7/20=0.64cm	0.60cm
63.	9.1/16=0.57cm	13.0/20=0.65cm	0.70cm
64.	9.3/16=0.58cm	13.1/20=0.66cm	0.70cm
65.	8.9/16=0.56cm	12.9/20=0.65cm	0.65cm
66.	8.6/16=0.54cm	12.7/20=0.64cm	0.65cm
67.	9.2/16=0.58cm	13.1/20=0.66cm	0.70cm
68.	8.0/16=0.50cm	12.1/20=0.61cm	0.60cm
69.	9.0/16=0.56cm	13.1/20=0.66cm	0.70cm
70.	8.2/16=0.51cm	12.1/20=0.61cm	0.60cm
71.	9.2/16=0.58cm	13.1/20=0.66cm	0.70cm
72.	8.8/16=0.55cm	12.9/20=0.65cm	0.65cm
73.	8.4/16=0.53cm	12.5/20=0.63cm	0.60cm
74.	9.4/16=0.59cm	13.3/20=0.67cm	0.70cm
75.	8.7/16=0.54cm	12.6/20=0.63cm	0.65cm
76.	8.7/16=0.54cm	12.4/20=0.62cm	0.65cm
78.	9.4/16=0.59cm	13.6/20=0.68cm	0.70cm
79.	8.5/16=0.53cm	12.6/20=0.63cm	0.65cm
80.	9.6/16=0.60cm	13.4/20=0.67cm	0.70cm
81.	9.2/16=0.58cm	13.2/20=0.66cm	0.70cm
82.	8.8/16=0.55cm	12.8/20=0.64cm	0.65cm
83.	8.9/16=0.56cm	12.7/20=0.64cm	0.65cm
84.	8.5/16=0.53cm	12.6/20=0.63cm	0.65cm
85.	8.2/16=0.51cm	12.4/20=0.62cm	0.60cm
86.	8.6/16=0.54cm	12.5/20=0.63cm	0.60cm
87.	8.9/16=0.56cm	13.0/20=0.65cm	0.70cm
88.	9.3/16=0.58cm	13.1/20=0.66cm	0.70cm
89.	8.5/16=0.53cm	12.7/20=0.64cm	0.65cm
90.	8.6/16=0.54cm	12.5/20=0.63cm	0.60cm
91.	9.1/16=0.57cm	13.0/20=0.65cm	0.65cm
92.	9.5/16=0.59cm	13.1/20=0.66cm	0.70cm
93.	8.4/16=0.53cm	12.5/20=0.63cm	0.60cm
94.	8.6/16=0.54cm	12.5/20=0.63cm	0.65cm
95.	8.7/16=0.54cm	12.6/20=0.63cm	0.65cm
96.	8.4/16=0.53cm	12.3/20=0.62cm	0.60cm
97.	8.0/16=0.50cm	12.1/20=0.61cm	0.60cm
98.	8.3/16=0.52cm	12.1/20=0.61cm	0.60cm
99.	9.5/16=0.59cm	13.1/20=0.66cm	0.70cm
100.	9.3/16=0.58cm	13.0/20=0.65cm	0.70cm

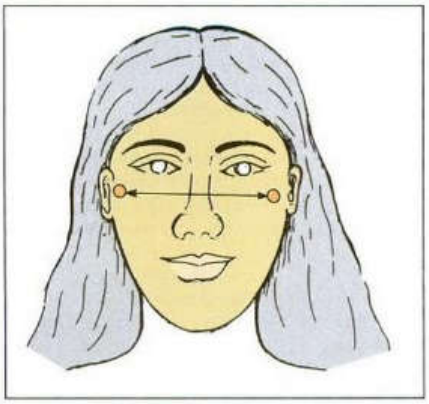

Figure 1. Bi-zygomatic width of face

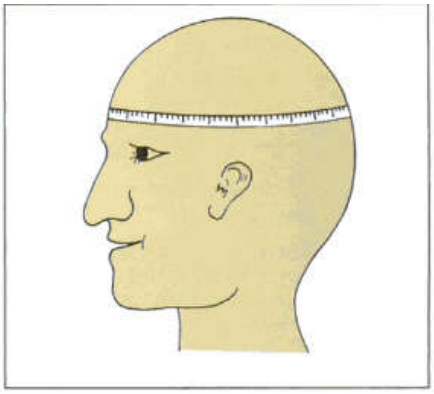

Figure 2. Circumference of head

DISCUSSION

- The highest measurement by using the bi-zygomatic width as a reference is 0.63cm whereas the highest measurement by using the length of face as a reference is 0.70cm.
- The lowest measurement by using the bi-zygomatic width as a reference is 0.50cm whereas the lowest measurement by using the length of face as a reference is 0.61cm.

Conclusion

This method cannot be reliable to measure the size of anterior tooth. Hence, further study using other method of measuring anterior should be explore more.

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