

The pattern of skeletal representation at Islamabad Dental Hospital: An estimate of their minimum reporting frequency to aid in planning areas of future research

Afeef Umar Zia^a, Haroon Shahid Qazi^b, Waheed Ullah Khan^c

Abstract

Introduction: Studies have been conducted in the last few decades to determine the prevalence of malocclusion in different populations and these studies show great variability. The objective of this cross-sectional study was to evaluate the frequency of various skeletal malocclusions reporting at department of Orthodontics, Islamabad Dentals Hospital, Bhara Kahu, Islamabad.

Material and Methods: One hundred and fifty patients who met the inclusion criteria were selected from the records. The records included history sheets and lateral cephalograms for each patient.

Results: 56% of the sample belonged to the skeletal class I group, 32% to skeletal class II and 12% to skeletal class III. 46.6% patients were normal angle, 34% were high angle and 19.3% were from the low angle group.

Conclusions: This study would enable the department of Orthodontics to formulate areas of future research as per the results depending on the kind of skeletal malocclusion reporting and also aid in the setting of clinical course work for the post graduate residents on the basis of the frequency of various malocclusions being treated.

Keywords: Prevalence, epidemiological data, skeletal discrepancy

Introduction

The growing public interest in facial esthetics has increased the demand of orthodontic treatment. Therefore it is important and empirical for orthodontic researchers to have epidemiological data of their region of practice to estimate the proportion and distribution of skeletal disorders. For past many decades, studies have been conducted to determine the prevalence of malocclusion in different populations and they show great variability.¹⁻¹¹ The results may differ due to many factors such as classification criterias, sample age,

sample size and intra examiner differences. Albeit the differences such studies give valuable information to the researchers in a given population and are an important determinant for the appropriate level of orthodontic services in both private and public sector. Furthermore such studies aid in assessment of allocation of resources for orthodontic treatment and can provide valuable information regarding the etiology of malocclusion and other complex traits. No such data exists for a population of Bhara Kahu, Islamabad.

Optimum documentation of skeletal malocclusion is valuable from an epidemiological standpoint because it describes the range of variations within the community in which orthodontic treatment is to be instituted. Such researches have enabled orthodontists to develop the scales of treatment needs for various communities.¹² Different means have been employed to label patients into various groups of malocclusion.

^a Corresponding Author, BDS, Senior Registrar, Department of Orthodontics, Dental Section, Islamabad Medical and Dental College, Bahria University, Islamabad, Pakistan
E-mail:afeef.umar@iideas.edu.pk

^b BDS, MS. Associate Professor and Head, Department of Orthodontics, Dental Section, Islamabad Medical and Dental College, Bahria University, Islamabad, Pakistan

^c BDS, FCPS. Assistant Professor, Department of Orthodontics, Dental Section, Islamabad Medical and Dental College, Bahria University, Islamabad, Pakistan

These can be quantitative or qualitative,¹³ have dental or skeletal basis or can be based on clinical or radiographic information. The identification means should be such that they are valid, reliable and easy for communication amongst dental community with adequate standardization. Literature shows that many of such methods such as over jet and overbite measurements in millimeters have been used in population studies.¹⁴ Furthermore these methods are useful in describing the extent of deviation of an occlusal trait for the purpose of establishing the severity of malocclusion and treatment prioritization.¹⁵

The objective of this study was to determine the prevalence of skeletal disorders in Bhara Kahu area, which will aid for planning areas of future research, at the department of Orthodontics, Islamabad Dental Hospital.

Material and Methods

One hundred and fifty consecutive patients, who reported to the Orthodontic Department, met the inclusion criteria and had their diagnostic records done were included in the study. Patients included in the study had a mean age of 19.5 with minimum reporting age of 4 years and maximum age of 33 years (Table I).

None of the patients had undergone orthodontic treatment previously. Orthodontic examination was performed by the authors. Six groups were formed according to the following criteria (Figure 1).¹⁶

1. Skeletal class I: ANB value between 0-4°
2. Skeletal class II: ANB value greater than 4°
3. Skeletal class III: ANB value less than 0°
4. Normal angle: SN-MP value between 28-36°
5. High angle: SN-MP value greater than 36°
6. Low angle: SN-MP value less than 28°

Informed written consent was taken from all patients who agreed to participate in the

study, after taking permission for this study from the Institutional Review Board. Following parameters were done.

The radiographic record included Lateral cephalogram taken in natural head position, with unstrained lips and teeth in centric occlusion. Radiographs were traced on 8 × 10 inch standard translucent acetate tracing paper, over a standard illuminated view box with a lead pencil (# 2 ½ HB). Sagittal disparity were determined by measuring SNA, SNB, ANB angles and the vertical problem was determined by measuring SN-MP angle (Figure 1), to establish the sagittal and vertical skeletal relationship of each patient. Patients with any systemic disorder (ectodermal dysplasia, cleft lip/palate, Down's syndrome etc), history of previous orthodontic treatment and extraction of a tooth due to trauma or pathological reasons were excluded. Two of the authors examined the records twice on two different occasions to reduce the likelihood of misinterpretation. If there was a disagreement on the presence/absence of a tooth, the records were examined by the third author and his decision was considered final. Data were analyzed on statistical package for social sciences (SPSS version 10). Descriptive statistics were used. Frequencies and percentages were calculated for gender and the skeletal discrepancy

Results

Out of the total sample, 60% were females where as 40% patients were males (Figure 2). Patients included in the study had a mean age of 19.5 with minimum reporting age of 4 years and maximum age of 33 years (Table I). 56% of the sample belonged to the skeletal class I group, 32% to skeletal class II and 12% to skeletal class III (Table II). 46.6% patients were normal angle, 34% were high angle and 19.3% were from the low angle group (Table III).

Table I. Age distribution

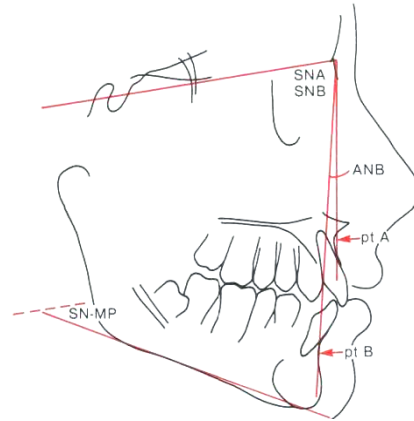
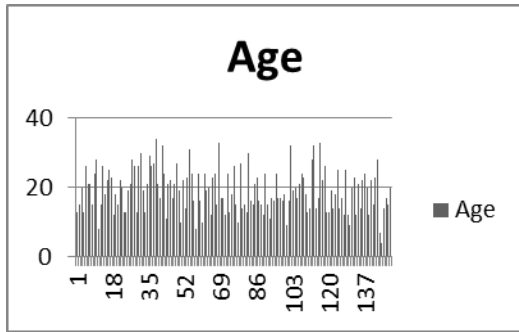


Figure 1. Sagittal and vertical measures

Table II. Distribution of skeletal pattern

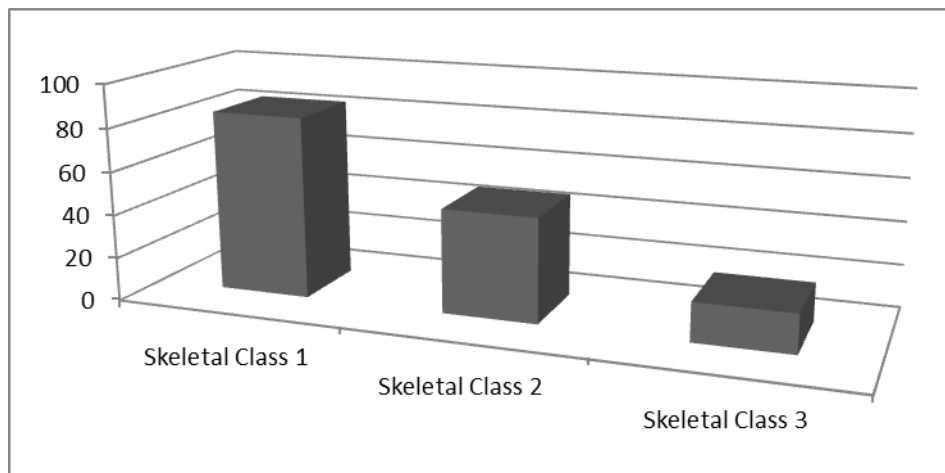
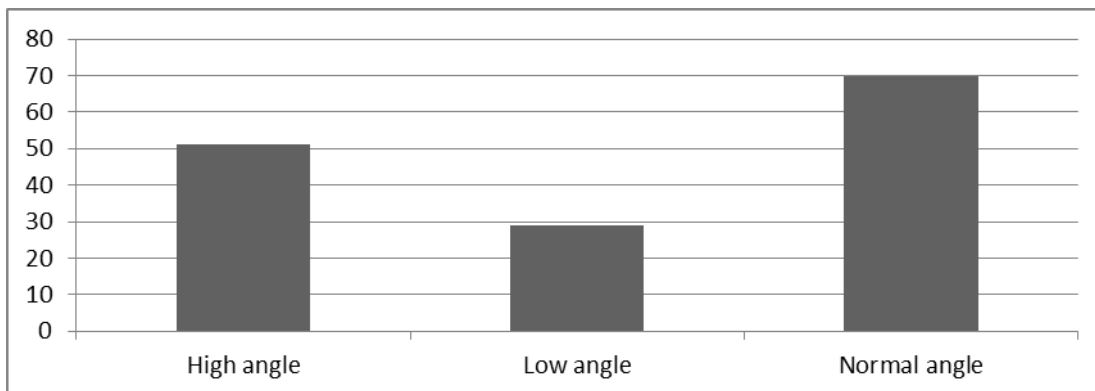


Table III. Distribution of vertical pattern



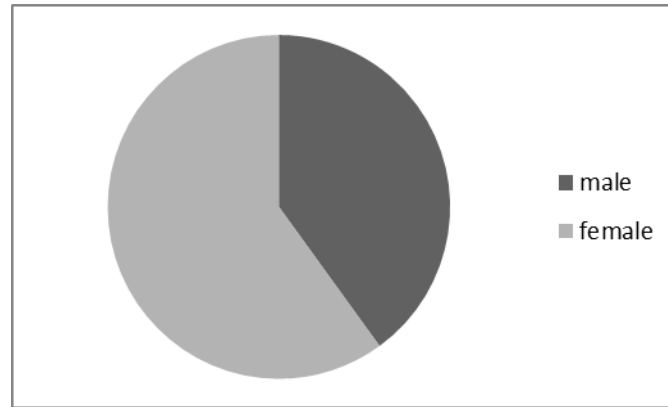


Figure 2. Gender distribution

Discussion

The prevalence of different types of malocclusions may show great variability even in population of the same origin. Clearly the evaluation of referred patients and the distribution of malocclusion types may give valuable information for planning an orthodontic service and research. According to results, skeletal class I pattern was found in 56% of the 150 patients examined. The frequency of class II and class III were 32% and 12% respectively. These results differ from prevalence reported by Sakrani,¹⁷ in which class II skeletal pattern was the most frequent type of anomaly with a 56% as compared to 32% found in this study. However it was interesting to note that both studies show a prevalence of 12% for skeletal class III pattern. This may be due to population difference between Karachi and the federal area of Bhara Kahu. Moreover the criteria of classification were different amongst both studies. Abida¹⁸ reported the frequency of skeletal class II pattern to be 41% which again is higher than what is reported in this study. Their study did not account for the frequency of class I and class III skeletal or the vertical pattern of patients. They considered a larger patient sample contrary to this study and this might have caused a difference in the results.

Khan¹⁹ focused on the dental malocclusion in a Pakistani sample and concluded that dental class II malocclusion were the most prevalent type in Pakistan. Erum and Fida²⁰ cross tabulated the Angles classification and the skeletal classes and reported Class I to be 48.7%, class II 48.1% and class III 3.2%. The method of reporting the classifications was different and might have caused the difference between the results.

This study has limitations and a longitudinal study in this domain would give the true depiction of skeletal pattern in the area under observation. This study does not account for the vertical pattern that might have put many patients to either class I, II or III skeletal pattern. Moreover a small sample size may not be a true representation of the population at focus. Lastly a study done on non orthodontic population would give the exact depiction of the skeletal and other variables under consideration which may be practically unviable.

Conclusions

The prevalence of skeletal pattern in an orthodontic population was 56% for class I, 32% for class II and 12% for class III. Class I was found to be the most prevalent. This study would enable the department of Orthodontics to formulate areas of future research as per the results depending on the kind of skeletal pattern reporting and also to

aid in formulating clinical course work for the post graduate residents on the basis of the frequency of various malocclusions being treated. The present study, being a cross sectional observation, should be followed by a longitudinal study in the future.

References

1. Silva RG, Kang DS. Prevalence of malocclusion among Latino adolescents. *Am J Orthod Dentofacial Orthop.* 2001;119:313-15.
2. Thilander B, Pena L, Infante C, Parada SS, de Mayorga C. Prevalence of malocclusion and orthodontic treatment need in children and adolescents in Bogota, Colombia. An epidemiological study related to different stages of dental development. *Eur J Orthod.* 2001; 23:153-67.
3. Willems G, de Bruyne I, Verdonck A, Fieuws S, Carels C. Prevalence of dentofacial characteristics in a Belgian orthodontic population. *Clin Oral Investig.* 2001; 5:220-6.
4. Chevitarese AB, Della Valle D, Moreira TC. Prevalence of malocclusion in 4-6 year old Brazilian children. *J Clin Pediatr Dent.* 2002; 27:81-5.
5. Hensel E, Born G, Korber V, Altvater T, Gesch D. Prevalence of defined symptoms of malocclusion among probands enrolled in the Study of Health in Pomerania (SHIP) in the age group from 20 to 49 years. *J Orofac Orthop.* 2003; 64:157-66.
6. Lauc T. Orofacial analysis on the Adriatic islands: an epidemiological study of malocclusions on Hvar Island. *Eur J Orthod.* 2003; 25:273-8.
7. Jones WB. Malocclusion and facial types in a group of Saudi Arabian patients referred for orthodontic treatment: a preliminary study. *Br J Orthod.* 1987; 14:143-6.
8. Yang WS. The study on the orthodontic patients who visited department of orthodontics, Seoul National University Hospital. *Taehan Chikkwa Uisa Hyophoe Chi.* 1990; 28:811-21.
9. Sari Z, Uysal T, Karaman AI, Basciftci FA, Usumez S, Demir A. Orthodontic malocclusions and evaluation of treatment alternatives: an epidemiologic study. *Turkish J Orthod.* 2003; 16: 119-26.
10. Ciuffolo F, Manzoli L, D'Attilio M, Tecco S, Muratore F, Festa F. Prevalence and distribution by gender of occlusal characteristics in a sample of Italian secondary school students: a cross-sectional study. *Eur J Orthod.* 2005; 27:601-6.
11. Onyeano CO, Aderinokun GA, Arowojolu MO. The pattern of malocclusion among orthodontic patients seen at Dental Centre, University College Hospital, Ibadan, Nigeria. *Afr J Med Sci.* 2002; 31:207-11.
12. Johnson M, Harkness M. Prevalence of malocclusion and orthodontic treatment need in 10-year-old New Zealand children. *Aust Orthod J.* 2000;16:1-8.
13. Tang EL, Wei SH. Recording and measuring malocclusion: a review of the literature. *Am J Orthod Dentofacial Orthop.* 1993;103:344-51.
14. Proffit WR. Malocclusion and dentofacial deformity in contemporary society. In: Proffit WR, Fields HW, Sarver DM (edi). *Contemporary orthodontics.* 4th ed. St Louis: Mosby.2007:3-23.
15. Han H, Davidson WM. A useful insight into 2 occlusal indexes: HLD (Md) and HLD (Cal Mod). *Am J Orthod Dentofacial Orthop.* 2001;120:247-53.
16. Proffit WR, Sarver DM, Ackerman JL. Orthodontic diagnosis: the development of a problem list. In: Proffit WR, Fields HW, Sarver DM (edi) *Contemporary orthodontics.* 4th ed. St Louis: Mosby 2007:167-233.
17. Sakrani H, Hussain SS, Ansari O, Hanif M. Prevalence of malocclusion in patients reporting in an orthodontic OPD of a tertiary care hospital. *Pak Orthod J.* 2010; 2 (1): 8-13.
18. Aslam A, Naeem A, Jan H, Bukhari G, Abbas Q, Amjad M. Prevalence of Class II malocclusion in Pakistani sample- A study. *Pak Oral and Dent J.* 2010; 30,(1):96-100.
19. Khan RSM, Tariq AS. Orthodontic patients; Prevalence of malocclusion in Pakistan. *Professional Med J.* 2011; 18 (4): 611-4.
20. Irum G, Fida M. Pattern of malocclusion in Orthodontic patients; A hospital based study. *J Ayub Med Coll Abbotabad.* 2008; 20(1): 43-7.