DEMOGRAPHICS OF ORTHODONTISTS IN ISLAMABAD AND RAWALPINDI DIVISION

Dr. Malik Arshman Khan[a], Dr. Haroon Shahid Qazi[b], Dr. Umar Farooq[c]

[a] BDS. Department of Orthodontics, Margalla College of Dentistry, Rawalpindi, Pakistan.
[b] BDS. MS. Associate Professor, Head of Orthodontic Department, Margalla College of Dentistry, Rawalpindi. Program Director, Dental Centre - Centre for Continuing Dental Education (CCDE) , Islamabad, Pakistan.
[c] BDS, MS (HI) Coordinator, Department of Medical Education, Margalla College of Dentistry, Rawalpindi, Pakistan. Program Coordinator, Dental Centre - Centre for Continuing Dental Education (CCDE) , Islamabad, Pakistan.

ABSTRACT

Objective: To determine the orthodontist/population ratio, number of dentists undergoing orthodontic training and to establish a baseline for orthodontic demographics in the region of Islamabad and Rawalpindi Division. **Materials and Methods:** Identification of the population statistics and the number of the orthodontists available in the region of Islamabad and Rawalpindi Division. **Result:** The population of this region is increasing but the orthodontic manpower for it is not sufficient and the Orthodontist:Population Ratio is low. **Discussion:** To date in Islamabad and Rawalpindi Division the appropriate manpower level has yet to be established. Manpower is difficult to forecast and is affected by many factors. Population projections are difficult to predict and we have to rely on assumptions pertaining to trends in fertility, mortality and migration. Interpretation of these trends however must be approached with caution. **Conclusion:** There is need of more orthodontists and orthodontic training institutes to meet the population demand in this region.

Keywords: Manpower, orthodontist: population ratio, Islamabad and Rawalpindi Division.

Correspondence: Dr. Haroon Shahid Qazi, Program Director, Dental Centre - Centre for Continuing Dental Education (CCDE), House # 164, St-33, I-8/2, Islamabad-Pakistan. Email: haroon77@gmail.com. Phone Numbers: 051-4441399, 0300-5001774.

INTRODUCTION

"A smile is a curve that sets everything straight" as quoted by Phyllis Diller. Undoubtedly a smile can set everything straight but it's the magic of orthodontics that straightens crooked teeth and leaves one with a beautiful smile**.** Orthodontics came into existence in the time of the ancient Egyptians, who used crude metal bands and catgut, but it was not until the late 18th century that the first practical appliances came into use.[1] Orthodontic appliances have also been found with Greek and Etruscan artifacts**.**[2] As early as 400 BC, Hippocrates referenced in his writings the correction of tooth irregularities[3] and when Greece was in its golden age, the Etruscans were burying their dead with appliances that would prevent collapse of teeth and act as space maintainers during life.[4,5] With time and evolution awareness among people has increased so patients seeking orthodontic treatment desire an optimum level of treatment from their orthodontist. Keeping up to the expectations of the patients and providing an optimum level of treatment is only possible when sufficient orthodontic manpower is available to meet the population demand**.** Today in some countries the need for orthodontic care cannot be accommodated due to lack of professional manpower whereas in others a surplus of orthodontic treatment facilities exist.[6,7]

This study aims at investigating the development and growth of orthodontists and comparing it with the general population statistics, to determine the number of dentists undergoing orthodontic training and to establish a baseline for orthodontic demographics in the region of Islamabad and Rawalpindi Division, so future comparisons can be made regarding the availability of specialists.

MATERIALS AND METHODS

Identification of the Number of Orthodontists Available

Personnel with orthodontic qualifications were identified from the Pakistan Medical and Dental Council (PMDC). The number of dentists undergoing orthodontic training was identified by directly contacting the supervisors conducting orthodontic training in these hospitals i.e. AFID, KRL Hospital and Islamic International Hospital. The data was

assimilated to determine the number of orthodontists in academic and teaching schools, private practice, public health service or a combination**.**

Identification of Population Statistics

The population figures and growth rates were obtained from the Federal Bureau of Statistics (www.statpak.gov.pk) and census publication no.161 approved by the Chief Census Commissioner.

RESULTS

The population of Rawalpindi Division and Islamabad (Table 1) was projected till 2015 with the help of the growth rate (Table.2&3) issued by the Federal Bureau of Statistics and the census publication. The population of Rawalpindi Division and Islamabad (Figure .1) in 1998 was (7,464,763)[8], in 2009 it would be (9,593,144) and in 2015 it would be (11,014,196).

The consultants in this region are 12 in number at present. The projected consultant growth was calculated by determining the growth rate of the consultants from the year 1998 (2 consultants), 2005(9 consultants) and 2009 (12 consultants) (Figure.2a). The growth rate calculated was 0.91 and was further used to project the growth of consultants till 2015 and the number of orthodontists available for the population of Rawalpindi Division and Islamabad was also calculated from year 1998 to 2015 (Figure.2b). In 1998 there were 2 consultants for 7,464,763 people (Orthodontist:Population Ratio 1:3732382), in 2005, 9 consultants for 8,771,842people (Orthodontist:Population Ratio 1:974649), in 2009, 12 consultants for 9,593,144people (Orthodontist:Population Ratio 1:799429), in 2010, 13 consultants for 9,813,234 people (Orthodontist:Population Ratio 1:760127),in 2011, 14 consultants for 10,039,684 people (Ratio 1:726461), in 2012, 15 consultants for 10,272,741 people (Ratio 1:697403), in 2013, 16 consultants for 10,512,663 people (Ratio 1:672165), in 2014, 17 consultants for 10,759,720 people (Ratio1:650134) and in 2015, 17 consultants for 11,014,196people (Ratio 1:630825).

The population of Rawalpindi Division and Islamabad falling under the age group of 10-29years was calculated and the number of orthodontists available to treat this age group was calculated (Figure.3). In 2006, there were 9 consultants for 3,727,466 people coming under the age group of 10-29years (Orthodontist:10-29yrs Population Ratio 1:414163), in 2009, 12 consultants for 4,003,787 people (Ratio 1:333649), in 2010, 13 consultants for 4,101,726 people (Ratio 1:317717), in 2011, 14 consultants for 4,202,785 people (Ratio 1:304109), in 2012, 15 consultants for 4,307,097people (Ratio 1:292403), in 2013, 16 consultants for 4,414,800 people (Ratio 1:282276), in 2014, 17 consultants for 4,526,039 people (Ratio 1:273477) and in 2015, 17 consultants for 4,640,967 people (Ratio 1:265806). The trainees undergoing orthodontic training at the moment are 24 in number (Table.4)

Table 1: Population projection of Islamabad and Rawalpindi Division

Year	Population
1998	7464763
1999	7642278
2000	7824666
2001	8012094
2002	8204737
2003	8389953
2004	8580234
2005	8771842
2006	8968737
2007	9171115
2008	9379179
2009	9593144
2010	9813234
2011	10039684
2012	10272741
2013	10512663
2014	10759720
2015	11014196

Table 2: Growth rate of Pakistan from 1989-2005

Pakistan Demographic Survey					
Rate	1989-94	1995-97	1999-2001	2003	2005
Growth Rate (Percent Per Annum)	2.94	2.62	2.12	1.95	1.90

Table 3: Growth rate of Islamabad and Rawalpindi Division in 1998

Growth Rate (1998) (Percent Per Annum)	Islamabad	Rawalpindi
	5.76	3.43

Table 4: Dentists undergoing orthodontic training in Islamabad and Rawalpindi Division

Year of Training	Number of Trainees
First Year	7
Second Year	6
Third Year	9
Fourth Year	2
Total	**24**

Figure 1: Population of Islamabad and Rawalpindi Division

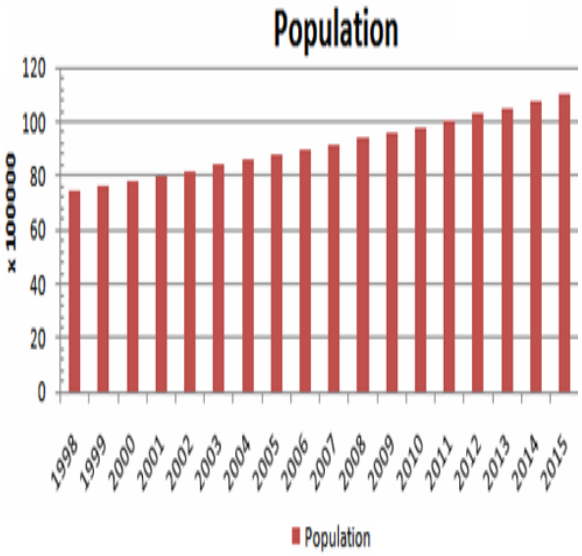


Figure 2(a): Available Orthodontists for the population of Islamabad and Rawalpindi Division in 1998, 2005 and 2009

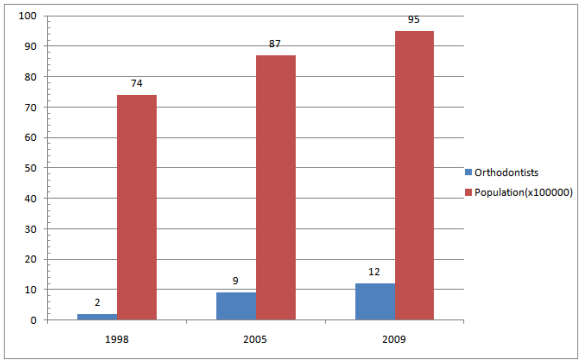


Figure.2(b): Projected Orthodontists for the population of Islamabad and Rawalpindi Division till year 2015

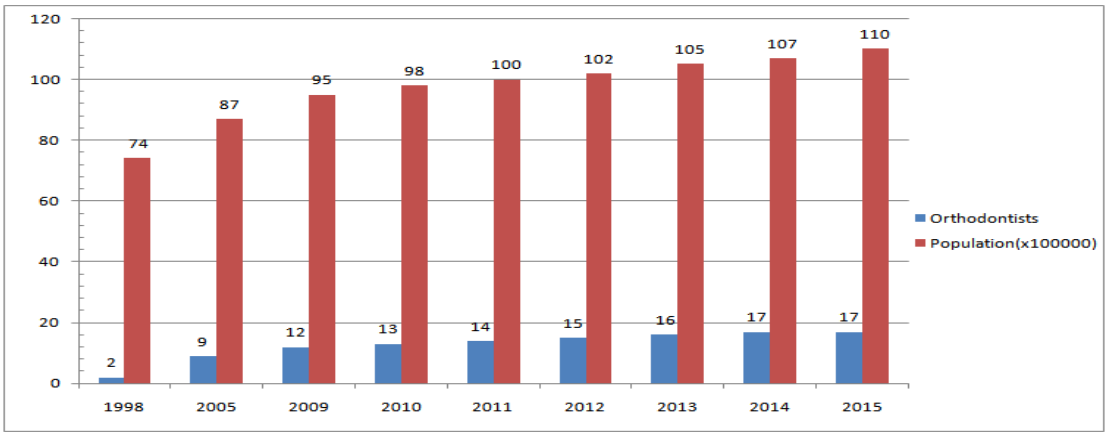
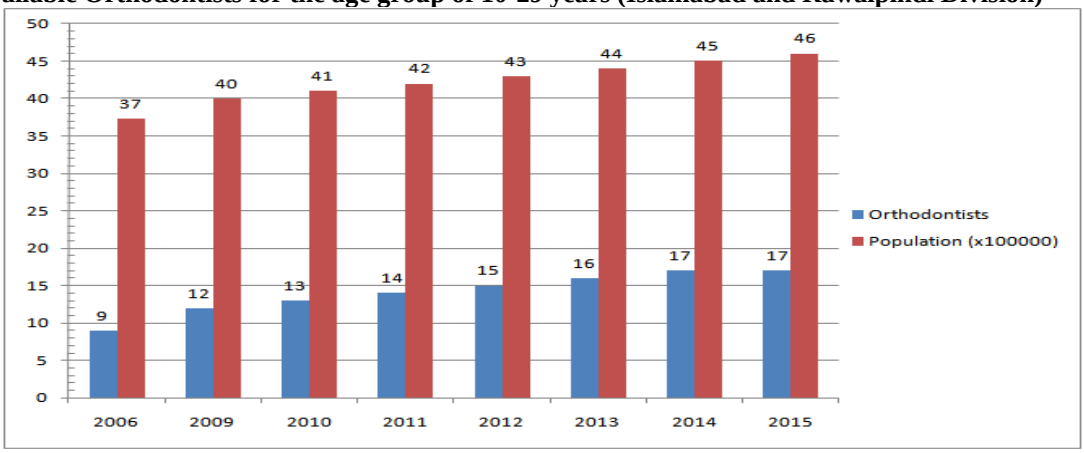


Figure.3: Available Orthodontists for the age group of 10-29 years (Islamabad and Rawalpindi Division)



DISCUSSION

It is difficult to forecast manpower requirements. There is no recognized ratio of orthodontist to population to work towards. Some factors should be taken into consideration such as the need for orthodontic treatment, the number of orthodontists available to provide the treatment, financial considerations, geographical factors, deployment of auxiliaries, changing practice and delivery of care. As manpower forecasting is complicated and is mostly based on unknown variables so at times it has resulted in conflicting reports in the literature such as in 1985 an overproduction of orthodontic specialists to accommodate future needs in the UK was predicted.[9] Seven years later reports of insufficient orthodontic manpower to meet the population's needs were reported.[10]

This study was carried out to establish the current demographics of orthodontists in the region of Islamabad and Rawalpindi Division. In UK the ideal manpower level in 1998 was identified as 480 specialists according to a report.[11] To date in Islamabad and Rawalpindi Division the appropriate manpower level has yet to be established. Population projections are difficult to predict and we have to rely on assumptions pertaining to trends in fertility, mortality and migration. Interpretation of these trends however must be approached with caution.[12]

According to the latest census that was carried out in 1998 the population of Islamabad and Rawalpindi Division was 7,464,763, no census has been carried out since then. The population projected for this region in 2009 is 9,593,144 which show that the population has increased over the years and by theyear 2015 it would be 11,014,196. Unfortunately the orthodontist:population ratio for this region is very poor such as in 1998 (2 orthodontists) the ratio was (1:3732382), in 2009 (12 orthodontists) (1:799429) and in 2015 (17 orthodontists), according to the consultant growth rate calculated and population projection the ratio should be (1:630825). The ratios of the year 2009 and 2015 are much better than that of 1998 and show some kind of improvement but still there is immense need of orthodontists in this region to meet the population demand.

According to a survey carried out by the orthodontic department of Margalla College of Dentistry, 90% of the patients seeking orthodontic treatment in this region come under the age group of 10-29years. For 2009 the 10-29yrs population is 4,003,787 and the orthodontist:10-29yrs population ratio is 1:333649. If we assume that 10% of the 10-29yrs population seeks orthodontic treatment then that population would be

400,379 and orthodontists available to treat this much population are 12 at the moment. Hence the orthodontist: 10% of 10-29yrs population ratio would be (1:33365). If we assume that by the year 2015 the 24 trainees undergoing orthodontic training become orthodontists then we will have 36 orthodontists in total to serve 11,014,196 people in 2015 and the orthodontist: population ratio would be 1:305950.

This study involved personnel with orthodontic qualifications only. It has not taken into account the reality of orthodontic treatment provided by general and pediatric dentists together with the possible introduction of orthodontic auxiliaries.

CONCLUSION

We are in dire need of orthodontists to meet the population demand of Islamabad and Rawalpindi Division. A system of ongoing monitoring of dental power is required. No manpower study is definitive and planning needs to be a continuous and dynamic process. Manpower studies being sophisticated do not necessarily lead to an integrated process of health manpower development unless the necessary social, economic, political conditions and a definite national policy is present.[13] With the emergence of more dental hospitals that conduct orthodontic training the Orthodontist:Population Ratio in this region can improve.

REFERENCES

1. Orthodontics in 3 millennia. Chapter 1: Antiquity to the mid-19th century
2. Proffit WR, Fields HW, editors. Contemporary orthodontics. 3rd ed. Saint Louis: Mosby; 2000
3. Hippocrates. Epidemics (Sixth Book); 400 B.C.
4. Guerini V. A History of Dentistry. Philadelphia, Pa: Lea & Febiger; 1909:67–76.
5. Weinberger BW. Orthodontics: An Historical Review of Its Origin and Evolution—Volume 1. St Louis, Mo: Mosby; 1926:48– 68, 183–195, 351–352, 478–47
6. Prahl-Andersen,B. and van't Hof,M(1981) Long-term planning of orthodontic manpower, British Journal of Orthodontics, 8,47-51.
7. Van Der Linden F.G.P.M.(1981) Orthodontia quo vadis, European Journal of Orthodontics,3,61-64.

8. 1951-98 Population Of Administrative Units(Census Publication Number.161)
9. Stephens,C.D.,Orton,H.S and Usiskin, L.A. (1985) Future manpower requirements for orthodontics undertaken in the General Dental Service, British Journal of Orthodontics,12,168-175.
10. Joint Response of the British Orthodontic Societies to the Nuffield Inquiry into Personnel Auxiliary to Dentistry (1992) British Journal of Orthodontics, 19,334-342.
11. Task Group for Orthodontics Report(1998) British Journal of Orthodontics,25,222-234
12. Marielle Blake,M.Therese Garvey and Burga Healy. An Update on Orthodontic Manpower in Ireland.
13. Mejia, A. and Fulop,T.(1978) Health manpower planning: an overview, In: T.L. Hall and A.Mejia (Eds) Health Manpower Planning: principles, methods, issues, World Health Organization, Geneva