DEMANDS, NEEDS, EXPECTATIONS, PATTERNS AND REASONS AMONG PATIENTS FOR TREATMENT WITH FIXED DENTAL PROSTHESES

Naveeda Idrees, Fazal Ghani

Khyber College of Dentistry, University Campus, Peshawar

ABSTRACT

Objective: *Needs, demands and expectations of patients regarding fixed dental prostheses (FDPs) are influenced by patient's factors including pattern of missing teeth, education, socio-economic status, age and oral health. These factors are explored in local patients wishing FDPs for the first time.*

Material and Methods: *During the period between November 2004 to March 2006, partially-dentate patients (n = 100) wishing to have conventional tooth-supported FDPs at the Department of Prosthodontics, Khyber College of Dentistry Peshawar, Pakistan were interviewed and clinically examined. Data were collected, regarding their age, gender, education, socio-economic status, oral hygiene and need for mouth and tooth-preparatory work. Patient's demands, needs, expectations and patterns of missing teeth and reasons for preferring FDPs were also assessed. Data were analyzed by descriptive statistics and Chi-square test.*

Results: *Patients were 44 males and 56 females with 92% not older than 45 years. Educated and socio-economically secure patients were 81% and 90% respectively. Only 2% were regular dental-attenders. A substantial need for pre-prosthetic & preparatory procedures in the form of periodontal (80%), conservative (76%) and dental extractions (80%) was noted. The pattern of missing teeth reflected bounded-spaces (142) and distal-extension-spaces (8). Bounded- spaces were posterior (109) and anterior (33). Reasons for consultation to have FDPs were functional in 56 % and aesthetics in 44%. Reasons for preferring FDPs were; psychological (90%), security (76%), easy to maintain (73%) improved-chewing (67%) and aesthetic (54%). Expectations were functional in 79% patients. Expectation for improved function was noted in 86 % males and 73% females. Expectation for improved-aesthetics was seen in 93.2% males.*

Conclusion: *Demand and need for FDPs was higher in males and in those with better social, educational and economic levels. Need for FDPs was realistic and for enhancement of chewing-function.*

Key Words: *Fixed partial dentures, needs, demands, expectations.*

INTRODUCTION

Demands, expectations and patterns of fixed prosthodontic treatments among patients are influenced by many factors. To cope with the ever-changing trends in the needs and demands of patients for fixed dental prostheses (FDPs), the specialty of Prosthodontics with a long history, has shown a remarkable adaptation through innovations.[1] However, the essence of a good treatment planning in the overall success of FDPs therapy can never be over emphasized.[2-4] The perceptions that dentists form regarding their patients could be explained not only by the variables of patient financial constraint but also by their behavioural, cultural and structural variables. In fact patient perceptions of dental care values are predictors of service provision and a source of variation in rates of service provision.[5]

It is known that patients-perceived treatment-needs are smaller than that professionally-determined.[6,11] In India, the unmet need to replace missing teeth in partially dentate patients was as high as 90% with a large number of elderly citizens having health and dental problems. Recent surveys[12-13] conducted on the prosthetic status and needs of Pakistani population revealed that only 5% of the age group 35-44 years who were partially dentate were using some

PATIENTS SELECTION CRITERIA

Inclusion Criteria:
Older than 16 years and partially dentate.
Having no past experience of FDP (Crown / Bridge) wearing.
Exclusion Criteria:
Younger than 16 years.
Very old and seriously ill patients
Having few remaining natural teeth in one or both jaws.
Having reduced intelligence and mental state and un-cooperative attitude

Table 1

type of prosthesis while 30% needed prostheses but were not wearing any.

The term "Need" though simple has many conceptual meanings and interpretations. Bradshaw in 1992, presented four categories of needs; normative-need (professionally expressed), felt or subjective-need (patient or population wanted), expressed-need or demand which in fact refers to felt-need turned into action.[15] It is to note that a "subjective-need" rarely exists without a normative need.[16] Comparative-need is assessed by studying the characteristics of a population using a service. If there are people with similar characteristics not receiving those services, they are still in need of those services.[17] Despite the above different categories of need, it is best defined as the quantity of dental health-care that expert opinion judges ought to be consumed over a time-period so that patients remain or become dentally healthy as is permitted by existing knowledge.[18 - 22]

Factors such as socio-dental, social, cultural background and appearance (aesthetic) are always considered essential in knowing about need and demand for prosthodontic treatment. In fact it has been shown in the developed countries that the demand for prosthodontic treatment was influenced more by aesthetic reasons as compared to functional reasons.[23 - 37]

Patients often become motivated to personally consider a replacement dental procedure, after seeing the dramatic transformation of other patients from an unattractive smile to a radiant facial enhancement. a patient's perception of replacement therapy is influenced by his level of education. a visit to dentist provides the patient an opportunity to be educated about different treatment options for replacing missing teeth. patients generally have a preconceived notion of a dental procedure that will address their functional or aesthetic problem. they may be unaware of other alternatives that are available. prosthodontists are obligated to inform their patients of the treatment option with the highest esthetic as well as functional potential. often, the selection of this option will lead to results beyond what the patient thought was possible. it is a duty of dentists to inform and educate their patients about the advantages and disadvantages of fdps.[36-37] furthermore, the effect of other factors such as the number of missing teeth, type, size, location and

CRITERIA, ASPECTS AND DESCRIPTIONS RELATED TO PATIENTS

Criteria / Aspect / Description	Males (N=44)	Females (N=56)	Total (N=100)
Patients within age range 16 - 45 years.	40 (90.9 %)	52 (92.9 %)	92 (92 0%)
Educated Patients	42 (95.5 %)	39 (69.6 %)	81 (81.0 %)
Acceptable socio-economic status	39 (88.6 %)	51 (91.1 %)	90 (90.0 %)
Acceptable dental attendance behaviour.	01 (02.3 %)	01 (01.8 %)	02 (02.0 %)
Acceptable mouth cleaning habit.	44 (100.0%)	56 (100.0%)	100(100.0%)
Toothpaste usage.	41 (93.2 %)	54 (96.4 %)	95 (95.0 %)
Usage of antiseptic mouthwash.	13 (29.5 %)	11 (19.6 %)	24 (24.0 %)
Acceptable Oral hygiene level.	39 (88.6 %)	52 (92.9 %)	91 (91.0 %)
Need For periodontal therapy.	35 (79.5 %)	45 (80.4 %)	80 (80.0 %)
Need for conservative dental therapy.	28 (63.6 %)	48 (85.7 %)	76 (76.0 %)
Need for tooth / teeth extraction.	34 (77.3 %)	46 (82.1 %)	80 (80.0 %)
Caries & Perio diseases as cause of extraction.	26 (59.1 %)	45 (80.4 %)	71 (71.0 %)
Used or using removable partial denture.	15 (34.1 %)	09 (16.1 %)	24 (24.0 %)
Reason for seeking FDP therapy.	24 (54.5 %)	30 (53.6 %)	54(54.0 %)
a. Functional improvement.	20 (45.5 %	26 (46.4 %)	46 (46.0 %)
b. Aesthetic improvement.			

Table 2

DISTRIBUTION OF PARTIALLY EDENTULOUS SPACES (SADDLES)

Jaw / Arch	Saddle Type	Males (N=44)	Females (N=56)	Total
Maxilla	DES	01	02	03
	Bounded	34	41	75
Mandible	DES	01	04	05
	Bounded	26	41	67
Both Jaws	DES	02	06	08
	Bounded	60	82	142

DES = Distal Extension Saddle.
Table 3

the number of saddles, demand and expectation of patients, patients level of education and socio-economic condition have not been investigated in our local setup. keeping these in mind, the present study is designed to collect information pertaining to these aspects of fdp therapy.

MATERIAL AND METHODS

This descriptive and comparative study was conducted at the Department of Prosthodontics Khyber College of Dentistry Peshawar during the period November 2004 to March 2006. Data were collected from 100 subjects fulfilling the inclusion and exclusion criteria (Table 1) who reported for replacement of their missing teeth with fixed prosthesis. The patients were interviewed and clinically examined, before any treatment was given to them. A convenience non-probability sampling technique was followed. Data from subjects were collected in a standardized manner using a structured proforma by one author (NI).

The first part of the proforma was designed to collect the personal data of the patient including age, sex, and socio – economic and educational status. The second part of the proforma was to record brief dental history to get each patient's attitude towards their dental treatment and whether they used or otherwise a removable partial denture (RPD) before requesting for FDPs.

The clinical suitability of mouth for FDP was determined after the examination of occlusion, condition of oral mucosa, periodontal condition (probing calculus and pocket, gingival bleeding), caries and mobility of all the teeth present. Clinical examination also included recording of the number, type, size and shape of saddles and classification on the basis of Kennedy method. The reason for their tooth loss was also recorded. The last part of the proforma was to record data about the patient's reason for preferring FDP and their level of expectations from these regarding function and aesthetic benefits.

RESULTS

The age range of the patients (n= 100) was 17–60 years with their mean age + standard deviation as 31+10.2 years. The population sample was very much homogenous in terms of age as can be seen from the mean ages for male (n = 44) and female (n = 56) patients as 30 + 10.2 and 32 + 10.2 years respectively. Further socio-demographic as well as other data regarding oral hygiene practices and usage of RPDs are given in Table 2. An inspection of these data show that a great majority of both male (90.9%) and female patients

PATIENTS REASONS FOR PREFERRING FDPS & EXPECTATIONS FROM FDPS.

Description	Males (N=44)	Females (N=56)	Total (N=100)
Reason for preferring FDP:			
1. Improvement of function.	32 (72.7 %)	35 (62.5 %)	67 (67 0%)
2. Improvementof aesthics.	26 (59.1 %)	28 (50.0 %)	54 (54.0 %)
3. Psychological wellbeing.	36 (81.8 %)	54 (96.4 %)	90 (90.0 %)*
4. Easy to maintain.	31 (70.1 %)	42 (75.0 %)	73 (73.0 %)
5. FDPs felt more secure.	39 (88.6 %)	37 (84.1 %)	76 (76.0 %)*
6. Others.	04 (09.1 %)	03 (05.4 %)	07 (07.0 %)
Moderate to high level expectation			
from FDPs:			
1. To restore function.	38 (86.4 %)	41 (73.2 %)	79 (79.0 %)
2. To restore aesthetics.	41 (93.2 %)	32 (57.1 %)	73 (73.0 %)*

Significant association between males and females for the aspect of FDP.
Table 4

(92.9%) requesting FDP therapy were not older than 45 years. Furthermore, irrespective of their gender many (81%) were educated and also many (90%) were socio-economically secure.

From the data in Table 2, it is also clear that despite the low figures for their dental attendance behaviour, there were some positive aspects among the majority of the patients regarding the oral hygiene habits (100%) and use of toothpaste (95%). It can also be seen. That there was a considerable need for the mouth preparatory work in the form of periodontal (80%), conservative (76%) and exodontias (80%) work. Similarly, in some more than half of the male (54%) and about 80.4% female patients the cause for loss of natural teeth could be attributed to periodontal diseases and caries (71%). It can also be seen from the data in the same table hat the tendency for use of RPD was very low among patients (24%) and that improvement of function (chewing and speech) and esthetic were the two predominant reasons for seeking consultation for treatment with FDPs.

Table 3 details the data of patients regarding the distribution and types of edentulous spaces (saddles). One could clearly see that in total the number of bounded saddles (142) with 75 in maxilla and 67 in the mandible were present as compared to a total of eight distal extension saddles.

The data of patients regarding their reasons for preferring FDPs and their level of expectations from these are detailed in Table 4. It can be seen that irrespective of the gender of the patients, FDPs were preferred by 90% patients for bringing improvement in their psychological esteem. To 76% patients FDPs were felt as more secure prostheses. They were also considered as easy to maintain by 73%. Similarly, they were needed for enhancement / improvement of function of chewing and speaking by 67%, and for a esthetics by 54%. Similarly, it can also be seen that the figures for moderate-high-level expectations from FDPs regarding their ability of restoring the function and a esthetics were 79% and 73% respectively.

DISCUSSION

It is interesting to note that as many as 92% patients demanding or feeling the need for FDPs were not older than 45 years. Therefore, this study shows that relatively younger patients would demand FDPs. Similarly, considering the relatively larger proportion of females demanding FDP therapy would also indicate greater felt-need for FDP therapy among the females within the age group of 16 – 45 years. These findings of our study support those of other studies showing that the largest group in demand for FDPs and other aesthetic dental services were females and the ageing baby-boomer group with their ages between 39 – 57 year.[9, 42] Similarly, older patients have been found reluctant to have dental prostheses as compared to those who are young[42] and thus indirectly support our finding. In our study 81% and 90% patients were educated and socio-economically secure. The higher number of educated and socio-economically secure patients as well as the presence of many bounded edentulous spaces in the mouths of patients reflects that patient-perceived needs regarding FDPs were realistic. These findings are also supported by others showing social class, gender, age and financial status as significant factors influencing the need for using dental services in general and prosthodontic / restorative dental services in particular.[46-47]

The data regarding the oral hygiene and of the use of toothpaste were though very encouraging and satisfactory among the patients, these could be hardly convincing in the event that only 2% of the patients had regular dental attendance behaviour and from the very poor levels of their dental health as seen from the need of the extent of preparatory periodontal, conservative and surgical dental therapies (Table 2). These may illustrate that probably the deficit in function of teeth in terms of chewing and aesthetics after their extraction was a more important concern to patients than that of maintaining natural teeth through regular professional visits to dentists.

In our study, the main reason of patients seeking dental consultation was to primarily improve function rather than aesthetics. This finding is in contradiction to those noted in other studies done in developed countries.[48] In one such study, cosmetic as the main reason among patients demanding dental treatments was noted. The demand for replacement of missing teeth is also strongly related to the position and location of missing teeth in the jaw, the perception and value given to dental treatment.[49–50] In our study posterior bounded spaces were more as compared to anterior and this might explain why patients were more concerned with the chewing function. Previous studies suggest that a desire to enhance chewing ability was frequent reason given for seeking dental treatment.[51] The act of mastication is one of the most important physiological determinants governing food intake. If people feel they can chew efficiently, then their food intake is not restricted by texture or hardness. An intact or restored masticating apparatus can exert a positive effect on nutrition by permitting wider selection of

food-items; where as compromised dentition can lead to a detrimental food ingestion patterns.[52] Walls and others demonstrated the association between tooth-loss and the diminished food selection that in turn influenced dietary adequacy, nutritional status and general health status.[53] In our study, it was also noted that 60% patients had multiple missing teeth with possible negative effect on their masticatory function. They were also aware of some of the consequences of not replacing their missing teeth. These observations are thus in accordance with the proposition of Maslow.[33]

There were clear degrees of gender differences when considering the preference for fixed partial denture therapy. But for all of them psychological, security and ease of maintenance associated with FDPs as reason to have them were more important than functional and aesthetic aspects of FDP therapy. This was despite their knowledge that their teeth could also be restored with RPD but wearing a removable partial denture always demanded emotional and functional adjustment. 24% patients were in fact those who had used RPD for their missing teeth. Even these patients now wanted to replace them with FDP. Another 70 patients were those who had the experience of RPD in their families. They described their problems with wearing and coping with a RPD as a multifaceted problem including physical suffering, practical problems, and decreased attraction as well as feeling of insecurity and uncertainty. Because of the higher failure rate many practitioners also hesitate to offer RPD treatment to their patients and may even prefer providing alternative modalities such as conventional implants supported FDP in cases when conventional tooth-supported FDPs are not feasible.[44] All these patients were of the view that having a fixed prosthesis would make them psychologically more secure because they would make their eating as well as drinking and talking easy. Patients want to be without having the fear of falling off their denture out of their mouths. After all, the maintenance of FDPs is regarded easier than that of RPDs.

Regarding expectation of patients from fixed bridge therapy, males had higher expectations both aesthetically as well as functionally than females, where as females were mostly not clear about their expectations. This is in contrast to the findings by Trulsson and colleague who found females more conscious about their dental appearance and feeling more embarrassment in social life than men.[45] This also indicates lack of dental awareness in our local set up. Mostly females came to the hospital with their attendants and that they had very little dental knowledge and dental awareness. The male participants in our study were also more educated than females. Among the female patients 35 were working at home only and only 21 were either students or working-outside home. The cost of the fixed dental prosthesis, lack of dental knowledge of our patients, reduced knowledge about dental treatment options for restoration of missing teeth were the main reasons for the many observed differences from other studies conducted in developed countries, with all educated and financially more secure populations.

The main limitation of the present study is the small sample size. Therefore, the findings related to FDP needs, demand, patterns and patients expectations could not be reflective of the true and general picture of the situation in the regional and national scenario. There is therefore, the need for an extensive work on the topic so as to give a broader view on the subject. Nevertheless, within these limitations of the present study, the following could be concluded.

1. Subjective need for having FDP was mainly a reflection of younger age and better education and socio-economic status.
2. FDPs were mainly requested for the restoration of chewing and speaking function.
3. The patient's expectations from FDPs, in order of priority were psychological, security, easy to maintain, long service life, enhanced function and esthetics.

REFERENCES

1. Hobkirk JA. Prosthodontics: Past with a future. J Can Dent Assoc 2005; 71: 326a - 326e.
2. Council on Dental Education and Licensure. Dentistry Definitions. Chicago: American Dental Association; April 2003. Available from URL:http://www.ada.org/prof/ed/specialties.asp #special (cited on 10 April 2005).
3. Raigrodski A J, Saltzer A M. Clinical consideration in case selection for all-ceramic fixed partial dentures. Pract Proced Aesthet Dent 2002; 14: 411-9.
4. Ibbetson RJ, Hemmings KW, Ward VJ. Variations in planning fixed bridge work- a group of dentists at a case based postgraduate course Br Dent J 1999; 187: 159-63.
5. Brennan DS, Spencer AJ. Service provision trends among Australian private general dental practitioners: 1983-84 to 1998-99. Int Dent J 2003:53; 145-52.
6. Meskin LH, Dillenberg J, Heft MW. Economic

impact of dental service utilization by older adults. J Am Dent Assoc 1990; 120: 665-8.

7. Beck JD, Lawrence HP, Koch GG. Analytic approaches to longitudinal caries in data in adults. Community Dent Oral Epidemiol 1997; 25: 42-51.
8. Dolan TA, Gilbert GH, Duncan RP, Foerster U. Risk indictors of edentulism, partial tooth loss and prosthetic status among black and white middle-aged and older adults. Community Dent Oral Epidemiol 2001; 29: 329-40.
9. Napankangas R, Salonen MAM, Raustia AM, Treatment need for fixed metal ceramic bridge prostheses inpatients treated by dental students in 1984-1996. J Oral Rehabil 2001; 28: 1101-5.
10. Berkag DB, Berg RG, Ettinger RL, Mersel A, Mann J. The old dental patient: the challenge of clinical decision- making. J Am Dent Assoc. 1996; 127:321-32.
11. Shah N, Parkash H, Sunderam KR. Edentulousness, denture wear and denture needs of Indian elderly-a community based study J Oral Rehabil 2004; 31: 467–76.
12. Khan AA, Ijaz S, Syed A, Qureshi A, Padhiar I, Sufia S et al. Oral health in Pakistan. A situation Analysis. Develop Dent 2004; 5:35–44.
13. Khan A.A Oral Health in Pakistan-A situation analysis. Ministry of Health, Government of Pakistan, Islamabad, 2004.
14. The distribution of US dentists ADA survey. Chicago: American Dental Association: 1994.
15. Bradshaw JS. Taxonomy of social need. In: McLaghlan G (Ed). Problems and Progress in Medical Care. Seventh Series. Oxford, UK: Oxford University Press, 1972:69-82.
16. Walter MH, Wolf BH, Rieger C, Boening KW, Prosthetic treatment need in a representative German sample. J Oral Rehabil 2001; 28:708-16.
17. Sheiham A, Spencer AJ. Health needs assessment In: Pine CM, (Ed) Community Oral Health. London: Wright, 1997: 39-54.
18. Spencer AJ. The estimation of need for dental care. J Public Health Dent 1980; 40:311–27.
19. Narby B, Kronstorm M, Soderfeldt B Palmqvist S. Prosthodontics and the patient: What is oral rehabilitation need? Conceptual analysis of need and demand for prosthodontic treatment. Part 1: A Conceptual analysis. Int J Prosthodont 2005; 18: 75–9.
20. US Department of Health and Human Services, Oral Health Services. Oral Health in America. A Report of the Surgeon General. Rockville, MD: NIDCR Research, 2000.
21. Basker R, O'Mullane DM. Removable prosthodontics services related to need and demand. In: Owall B, Kayser AF, Carlsson GE (Eds). Prosthodontics. Principles and management strategies. London: Mosby-Wolfe, 1996; 223 – 35.
22. Todd JE, Lader D. Adult dental health 1988, London: HMSO, 1991.
23. Kayser AF, Witter DJ. Oral function needs and its consequences for edentulous older people. Community Dent Health 1985; 2: 285 – 91.
24. Oosterhaven SP, Westert GP, Schaub RMH. Perception and significance of dental appearance, the case of missing teeth. Community Dent Oral Epidemiol 1989; 17:123 - 6.
25. Avorn J. Needs, wants, demands, and interest. In: Bayer R, Caplan AC, Davids N, (Eds). In Search of equity. New York: Plenum 1983.
26. Sodderfeldt B. A system for theoretical perspective on the health care system [in Swedish]. Socialcedicin Tidskr 1981; 4-5:239 - 45.
27. Grytten J. The effect of the price of dental services on their demand and utilization in Norway. Community Dent Health 1991; 8:303 -10.
28. Furino A, Douglass CW. Balancing dental service requirements and supplies: the economic evidence. J Am Dent Assoc 1990; 121:685–92.
29. The Academy of Prosthodontics. The Glossary of Prosthodontic Terms. Ed. 8. J Prosthet Dent 1994; 71: 71 -112.
30. Tervenon T. Condition of prosthetic constructions and subjective needs for replacing missing teeth in a Finnish adult population. J Oral Rehabil 1988; 15: 505 - 13.
31. Bjorn AL, Owal B. Partial dentualism and its prosthetic treatment. A frequency study within a Swedish population. Swed Dent J 1979; 3: 15 - 25.
32. Grace M. Changing expectations. Br Dent J 2000; 89: 233.
33. Maslow AH, Stephens DG Heil M. Maslow on management, New York, Wiley, 1998.

34. Patzer GL. Understanding the causal relationship between physical attractiveness and self esteem J Prosthet. Dent 1996; 8: 144 - 7.

35. Elias AC, Sheiham A. The relationship between satisfaction with mouth and number and positions of teeth. J Oral Rehabil 1998; 25: 649 - 61.

36. Priest G, Priest J. Promoting esthetic procedures in the prosthodontic practice. J Prosthodont 2004; 13: 111 - 7.

37. Seals RR. Implant, Esthetic, and Reconstructive Dentistry: Parameters of care for the specialty of Prosthodontics; J Prosthodont, 2005; 14: 2 -103.

38. Graham R, Mihaylov S, Jepson N, Allen PF, Bond S. Determining need for removable partial dentures: A Qualitative study of factors that influence dentist provision and patient use. Br Dent J 2006; 200: 155 - 8.

39. Asri NY, Al-Harbi S. Evaluation of the level of the patient's awareness and practice of their treatment rights. Pak Oral Dent J. 2001; 21: 64-77.

40. Small BW. Successful dentist-patient communication for optimal esthetic results. Dent Times 2006; 1.

41. Christensen GJ. Informing patients about alternatives. J Am Dent Assoc 1999; 130: 730 – 2.

42. Casamassimo PS, Harmsk A, Parrish JL others: Future of dentistry and dental workforce. J Am Dent Assoc 2002; 133: 1226 – 35.

43. Koretz G. Bless the baby boomers. Business Week 2002; 30: 37 – 86.

44. Mazurat NM, Mazurat RD. Discuss before fabricating: Communicating the realities of partial denture therapy. Part – II: Clinical Outcomes. J Can Dent Assoc 2003; 69: 96 - 100.

45. Trulsson U, Engstrad P, Berggren U, Nannmar U, Branemark P-I. Edenutlousness and oral rehabilitation: experiences from the patients' perspective. Eur J Oral Sci 2002; 110: 417-24.

46. McGrath, C. Bedi. R. Severe tooth loss among UK adults who goes for oral rehabilitation? J Oral Rehabil 2002; 29: 240 - 4.

47. Marcus SE, Drury TF, Brown LJ, Zion GR. Tooth retention and tooth loss in the permanent dentition of adults: United States, 1988-1991. J Dent Res 1996; 75: 684 - 95.

48. Agerberg G, Garlsson GE. Chewing ability in relation to dental and general health. Analyses of data from a questionnaire. Acta Odontol Scand 1981; 39(1): 147 - 53.

49. Witter DJ, Von Palenstein Heldman WH, Creugers NH, Kayser AF. The shortened dental arch concept and its implications for oral health care. Community Dent Oral Epidemiol 1999; 27:249 - 58.

50. Frank RP, Milgrom P, Leroux BG, Hawkins NR. Treatment outcomes with mandibular removable partial dentures: a population-based study of patient satisfaction. J Prosthet Dent 1998; 80: 36 - 45.

51. Zarb GA, Begman B, Clayton JA, MacKay HF. Prosthodontic treatment for partially edentulous patients. St. Louis: C.V. Mosby; 1978.

52. Chauncey HH, Kapur KK, Feller RP, Wayler AH. Altered masticatory function and perceptual estimates of chewing experience. Spec Care Dentist 1981; 1: 250 - 5.

53. De Baat C, McCord JF, Hoad-Reddic G, Witter DJ. Geroprosthodontics: The Nijmegen and Manchester dental schools approach. Gerodontology 1997; 14: 59 - 63.

Address for Correcpondence:
Dr Fazal Ghani,
Head, Department of Prosthodontics,
Khyber College of Dentistry,
P.O. University Campus
Peshawar – Pakistan.
Email: fazalg55@hotmail.com &
f.ghani@yahoo.co.in