# AWARENESS AND ATTITUDE OF DENTISTS TOWARDS SHORTENED DENTAL ARCH CONCEPT IN RAWALPINDI ISLAMABAD

[1]MUHAMMAD FAROOQ KAMRAN, [2]ADNAN HAFEEZ, [3]RAI TARIQ MASOOD, [4]ZAHIR SHAH
[5]MISBAH REHMAN, [6]MARIAM KHAN

## ABSTRACT

*Shortened dental arch concept is a practical and cost-effective choice in geriatric patients without any prosthesis for posterior segment of the mouth. The objective of the current study was to explore dentists' knowledge and their treatment approaches regarding shortened dental arches. It was a questionnaire-based cross-sectional survey performed in Rawalpindi Islamabad in which 200 self-structured questionnaires were distributed among dental practitioners. The questionnaire included common information about SDA concept, awareness, its use and different treatment approaches by dentists in SDAs.*

*Only 39.67% dentists were aware of SDA concept.Practitioner having less than 10 year experience were more aware about SDA concept (64.86%) as compared to dentist with experience more than 10 years(P value = 0.002).Main reason to restore missing molars was to improve mastication(82.06%). Acrylic RPD was most common treatment option in SDA (64.67%). Only (13.59%) dentists utilized SDA concept as treatment option and avoided any prosthesis.*

*This study found that awareness about SDA among dentist is low and this concept is not widely utilized.SDA concept can be a cost effective and problem based approach in clinical management of patients especially in developing countries such as Pakistan.*

**Key Words:** *Shortened dental arch, molar replacement, dentist's attitude*

## INTRODUCTION

Maintaining complete dental arches (CDA) is a basic objective in restorative dentistry by restoring all mutilated teeth. [1,2]However, due to financial or dental factors, preservation of dental arches having at least 28 teeth may not be achievable always.[2,3] In developing countries like Pakistan, extraction is the most common cure to relief pain due to decayed teeth.[4] Extractions of teeth result into interrupted or shortened dental arches.[4,5] In this regard, World Health Organization described the goal for oral health as "the retention throughout life of a functional, aesthetic, natural dentition of not less than 20 natural teeth and not requiring recourse to prosthesis".[5]

In 1981, a Dutch Prosthodontist, Arnd Kayser[6] gave the concept of shortened dental arch. According to Kayser, restoration or replacement of all the teeth which are lost is not required for satisfactory and successful oral functioning.[5,6] Functions of molars are fulfilled by premolars and anterior teeth in geriatric patients.[7]

Shortened dental arch is defined as a "dentition of a minimum of 10 occluding tooth pairs (e.g., all anterior teeth and premolars) as a sub-optimal but still acceptable functional level"[6,8,9] The purpose of shortened dental arch concept is to preserve a functional dentition of middle-aged and elderly patients by focusing treatment and finance on strategically significant teeth like the anterior and premolar teeth, and avoiding extensive restorative treatment in the molar sites or replacing lost molars.[5,10] Evidence indicates older individuals with a reduced dentition of four intact premolars and one occluding pair of molars have adequate masticatory function and are able to maintain satisfactory levels of occlusal stability.[11] Kayser[6] identified that factors like limited finance, lack of motivation, poor

[1] Dr Muhammad Farooq Kamran, BDS, FCPS, Assistant Professor Prosthodontics, Rawal Institute of Health Sciences, Islamabad, For Correspondence: House 791, Street. 76, Sector I-8/3, Islamabad. E-mail: dr_mfk786@hotmail.com Cell: 0346-5197620
[2] Dr Adnan Hafeez, BDS, MCPS, Assistant Professor Prosthodontics, Rawal Institute of Health Sciences, Islamabad, Email: adnan.hafeez16@gmail.com Cell: 0334-5624796
[3] Dr Rai Tariq Masood, BDS, MSc, Associate Professor Community Dentistry, Rawal Institute of Health Sciences, Islamabad, E-mail: raitariq84@hotmail.com Cell:0333-5718658
[4] Dr Zahir Shah. BDS, Demonstrator in Prosthodontics at Rawal Institute Of Health Sciences, Islamabad
[5] Dr Misbah Rehman, BDSDemonstrator in Prosthodontics at Rawal Institute Of Health Sciences, Islamabad.
[6] Dr. Mariam Khan, BDS, Demonstrator in Prosthodontics at Rawal Institute Of Health Sciences, Islamabad

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oral and general health act as barriers for extensive restorative treatment and favor not to extend SDA with prosthesis.[12,13] However, where loss of posterior teeth results in functional problems like occlusal instability, TMJ problems, impaired chewing or aesthetic issues, replacement of lost molars is positively advised.[14-16]

In many countries practitioners accept SDA concept and use it as problem based treatment option, however, still many dentists give removable partial denture, cantilever fixed prosthesis and implant supported fixed prosthesis for different reasons.[16,17] Globally a large number of partial dentures are provided by the public and private sectors perhaps without any benefit to the patient.[18,19] In most instances it may bea potential waste of resources because of low rate of patient acceptance and usage of RPD.[20,21]Extension of the SDA by either cantilevered fixed bridges or implant-supported prosthesis appeared to be uncommon practice in geriatrics patients.[21,22]

Dentists' awareness and their attitude towards SDA concept as treatment option vary among different parts of the world. Data on Pakistani dentists' awareness of the SDA concept is sparse.The current study was conducted to analyze the dentists' awareness and their attitude towards the shortened dental arches considering that SDA treatment option can ensure oral functions with limited finance in Pakistani geriatric patients. Results of this study can be used to improve SDA knowledge among practitioners and patients.

## METHODS

A self-structured data collection questionnaire was developed and validatedthrough a pilot study at Rawal Institute of Health Sciences, Islamabad. The pilot study included 5 dentists and its objective was toassess the clarity and the viability of the questions. The study was approved by Research Ethics committee of Rawal Institute of Health Sciences, affiliated with Shaheed Zulfiqar Ali Bhutto Medical University, Islamabad.The targetpopulation for this cross sectional survey was dental practitioners registered with PMDC working in Rawalpindi, Islamabad. The survey was conducted over six month period starting from June2017. Questionnaires were distributed among 200 dental practitioners working in government hospitals and private dental clinics.The questionnaire included gender, age, working experience, education level, specialty of practitioners and general information about SDA. Questions regarding knowledge about SDA, use of SDA concept, its application, reasonsto restore SDA cases and the common treatment modalities selected by the dentists to treat such cases were the main target. Completed forms were collected from practitioners on the same visit.

Data were analyzed on computerprogram SPSS version 17. Mean and standarddeviation was calculated for age. Percentage was calculatedfor other variables. The relationship between the working experience of the respondents and their awareness of SDA concept wasdetermined using Chi-Square test. P-value $\leq 0.05$ wasconsidered for significance.

## RESULTS

Out of the 200 copies of the data forms that were distributed, 184 practitioners returned completed questionnaire. A higher response rate of 92% was attained during this survey.

Dentists' awareness about SDA concept and WHO criteria of minimum number of teeth for oral health are presented in Table 1. Comparison of years of experience and awareness about SDA conceptis presented in Table 2. Statistical significant difference was found (P value= 002). Table 3 shows the reasons given by practitioners to restore missing molars. Table 4 different treatment modalities used by dentists to restore shortened dental arches.

## DISCUSSION

Dental caries and periodontal problems result in earlier loss of molars than other teeth.[4] Absence of molars lead to shortening of dental arches.[4,6] Different studied concluded patients having healthy premolars and anterior teeth can fulfill the requirements of a functional dentition.[1,2,3,7,9] In this context,Kayser[6] gave SDA concept as a "problem-oriented approach".This approach is not only cost effective but time saving, less demanding where all focus and finance is put on maintaining health of remaining natural teeth. [2,10]Due to lack of extensive economic and dental resources as pointed out by WHO, this concept is a right option worldwide.[6] Considering geriatric patient having cognitive, physical, sensory deficiencies, SDA concept is of particular value.[2,18,19]

Considering awareness of dentist, low proportion of dentist (39.67 %) was aware of SDA, whilethe majority (60.33%) of the practitioners was unaware.The result of a similar study in Jeddahby Alammari[2] showed that34.4% dentist were aware of the concept. Another study in Western Cape Province, South Africa by khan et al[7] showed that 40% respondents were aware of the concept.Guptaet al[8] in India showed only 22.9% dentists were aware of the concept.Dentist having less than 10 years clinical experience were more aware about SDA concept as compare to senior dentists(P=.002). Abuzar et al[3] in their study reported similar difference of knowledge when related with experience of dentists (P=0.004).This significant difference of awareness may due to more exposure of recent graduate to updated literature about SDA.

Regarding application of SDA, this study shows only few practitioners (13.59%) considered SDA in clinical practice as treatment option in shortened dental arches.In a study by Vohra F et al [9] in Saudi Arabia showed that 53.9% specialist used SDA concept in less than 10% patients while 54.8% post graduate trainees 46.6% general dental practitioners never used this

TABLE 1: AWARENESS OF DENTISTS ABOUT SHORTENED DENTAL ARCH CONCEPT

| Questions | Response | Frequency | |
|---|---|---|---|
| | | N | % |
| SDA awareness | Yes | 73 | 39.67 |
| | No | 111 | 60.33 |
| Minimum number of teeth recommended as treatment goal for oral health by WHO without any prosthesis | Yes | 70 | 38.04 |
| | No | 114 | 61.96 |
| Age group where SDA is indicated | More the 50 year of age | 117 | 63.59 |
| | Middle age patients | 65 | 35.33 |
| | Young patients | 02 | 0 |
| | Children | 0 | 0 |
| SDA proposed criteria knowledge | Yes | 05 | 2.75 |
| | No | 179 | 97.28 |

TABLE 2: AWARENESS OF DENTISTS ABOUT SDA ACCORDING TO YEARS OF EXPERIENCE

| Year of experience | Aware (N) % | Unaware (N) % | Total (N) |
|---|---|---|---|
| 1-10 years | (48) 64.86 | (26) 35.13 | 74 |
| More than 10 years | (25) 22.73 | (85) 77.27 | 110 |
| Total | (73) 39.67 | (111) 60.33 | 184 |

P=002

TABLE 3: JUSTIFICATIONS GIVEN BY DENTISTS FOR REPLACEMENT OF 1ST, 2ND AND 3RD MOLARS

| Justification | Frequency | |
|---|---|---|
| | N | % |
| Improve masticatory functions | 151 | 82.06 |
| To restore posterior support | 147 | 79.89 |
| Prevention of anterior tooth wear | 121 | 65.76 |
| To maintain health of TMJs | 99 | 53.80 |
| For patient desire | 114 | 61.96 |
| Esthetic | 70 | 38.04 |
| Income | 49 | 26.63 |

Note; Multiple answer were given by respondents for this question.

concept in practice.However, 106(69%) of the dentists did not apply the concept, even if they knew about it, while 48 (31.1%) used it, but with varying frequencies. A similar rate of application of the SDA by dentally qualified staff in restorative dentistry in Netherlands was reported by Witter et al.[16]

In current study main reason given by dentist to replace missing molars was to improve mastication (82.06%).Other reasons given by dentist to replace missing molar include establishment of posterior occlusal stability (79.89%), to prevent wear of anterior teeth (65.76%), for TMJ health (53.80%), patient will for full arch (61.96%), and for aesthetic reasons (38.04%). Abuzar et al[3] in their study showed that reasons given by dentists to restore SDA include restoration of posterior support (78.3%), improvement of mastication (77.7%) and for prevention anterior tooth wear (72.6%). In current study one reason given by dentists (26.63%) to replace molars financial profit .This may be due to fear of losing income.Alammari[2]showed that 52.6% practitioners think that they shall face profit loss if they utilize the SDA concept in their practice. Khan et al[7]showed that only 0.5% dentists were concerned about 'loss of income' whereas 37% said 'nothing' would prevent them from proposing and implementing the SDA concept as a treatment option.

TABLE 4: SELECTED MODE OF TREATMENT FOR SDA BY PRACTITIONERS

| Treatment modality | Frequency | |
|---|---|---|
| | N | % |
| No molar replacement/utilization of SDA concept | 25 | 13.59 |
| Acrylic partial denture | 119 | 64.67 |
| Cast partial denture | 78 | 42.39 |
| Cantilever bridges | 09 | 4.89 |
| Implant supported fixed prosthesis | 43 | 23.37 |

Treatment option by most ofthe dentist for SDA in current study was acrylic partial denture and secondly cast partial denture. In UK removable partial denture is most popular treatment option in SDA cases due to low cost and simplicity. However, Käyser et al. [6,10] considered RPD as "overtreatment" in SDA because of

high failure rate, oraldiscomfort, and many problems were associatedwith RPDs. Old aged SDA patients may chew more comfortably their SDAs rather than by an SDA and RPD.[3,7,9,20] Cantilever resin-bonded fixed partial dentures are another treatment option in SDA with better functional outcomescompared to mandibular RPDs .[9,20]However, this treatment option is selected by fewer practitioners despite it benefits.[7,9,20]Implant supported fixed dental prosthesis as treatment SDAs cases is less frequent because of cost, medical conditions, complicated treatment planning and procedures in old patients.[20,21,22]

## CONCLUSION

Most dentists accept Shortened dental arch concept but do not utilize the concept in clinical practice. Lack of adequate knowledge and understanding of the concept requires that at undergraduate level and in dental continuing education SDA concept should be taught and practiced.With continuous worldwide changes, e.g. in dental health andeconomy, the SDA concept requires more researchand discussion.

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## CONTRIBUTIONS BY AUTHORS

| | |
|---|---|
| **1 Muhammad Farooq Kamran :** | Topic selection, Abstract, Introduction and discussion. |
| **2 Adnan Hafeez:** | Cross References and revision. |
| **3 Rai Tariq Masood:** | Analysis, Interpretation of data, final review. |
| **4 Zahir Shah:** | Data collection. |
| **5 Misbah Rehman:** | Tables. |
| **6 Mariam Khan:** | Pilot study data collection. |