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Original Article

Dentistry Section

Experience from Classroom Teaching to Clinical Practice Regarding Shortened Dental Arch (SDA) Concept Among Dentists – A Questionnaire Study

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ABSTRACT

Introduction: Periodontal disease and dental caries are the common oral conditions which cause loss of teeth, mostly molars. This further leads to Shortening of Dental Arch and Shortened Dental Arch (SDA) concept provides the overall requirements of functional dentition at reduced cost without compromising the health.

Aim: The aim of the present study was to assess the Knowledge, Attitude and Practices (KAP) towards SDA concept among dentists of Ghaziabad city (Uttar Pradesh, India).

Materials and Methods: A cross-sectional study was conducted among 514 dentists working as academicians or clinicians or both. KAP questionnaire consisting of questions related to SDA concept was distributed to them. Data were analyzed using Statistical Package for Social Sciences (SPSS) 18.0 (SPSS Inc., Chicago, IL, USA) and descriptive and analytical tests, including mean, standard deviation, and Chi square test were used.

Results: Of the 514 dentists, only 493 dentists responded to the questionnaire, generating the response rate of 95.5%. Only 113 (22.9%) had knowledge about this concept. Clinicians were found to have more knowledge regarding the SDA concept ($p<0.05$). Also years of experience and level of knowledge among dentists regarding SDA was found to be statistically significant ($p<0.05$).

Conclusion: The study showed lack of knowledge regarding SDA concept among dentists and also only few dentists practice the SDA concept on their patients. If used judiciously the SDA concept can serve as a cost effective and functionally oriented approach in clinical management of patients.

Keywords: Attitude, Dentists, Dental arch, Knowledge, Temporomandibular disorders

INTRODUCTION

Recent advancements in the field of medical and dental research have shifted the focus of clinicians to the preservation of functional dental arches. Tooth mobility has always attracted the interest of researchers and was considered as an inexorable change of the ageing process. But now it is seen to be the consequence of most of the common oral diseases i.e., caries and periodontitis which might lead to tooth bounded spaces due to missing molars which further lead to shortening of the dental arches unilaterally or bilaterally. Due to dwindled number of posterior teeth, there is sparse masticatory efficiency as well as performance with declined patient satisfaction. In these circumstances, oral rehabilitation has the capacity to fairly replace all of lost teeth to restore function [1,2]. But conventional approaches were based on factual knowledge and in-vitro trials of dental materials as high-level evidence is impaired [3].

In the earlier times it was believed to replace all the missing teeth to prevent occurrence of occlusal problems and temporomandibular disorders. But in recent times the dentists face the challenge of provision of dental restoration so as to integrate and function with the dynamics of stomatognathic system [2,3]. Oral health by retention of healthy, natural, functioning dentition comprising not less than 20 teeth and not requiring prosthesis, has been described as a goal for oral health by WHO in 1992. This indicates a complete turnover from the conventional treatment approach of restoration of complete dentition [3].

Numerous healthcare resources are available but how to assign them in equal way is always a matter of concern and this matter has been augmented by the decline in economics with funded dental services which further pushes to rationale the cost-effectiveness of the services. Moreover at the same time rising number of dentate elderly patients needs tooth replacement to provide a functional dentition into their old age. So, cost effective treatment approach in this population has sizeable consequence [4].

Kayser in 1981 has given the SDA concept which is the minimum treatment with a preservation or restoration of the shortened dental arch. SDA 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" [5]. Many studies have said that SDA concept has various side effects like Temporomandibular Disorders (TMD), tooth migration, attrition, reduced chewing efficiency or poor aesthetics, etc., but various researches have proved it wrong [3,6].

The acceptable oral function is the key role of SDA concept which is due to occluding pair of remaining number of teeth. So, the treatment is related to maintenance and preservation of the incisors, canines and premolars present in the arches, which can facilitate the patient to adapt their mastication [6]. Therefore, the SDA concept is based on WHO goal for oral health according to which the presence of not less than 20 natural, functional and aesthetic dentition throughout life does not require prosthesis [7].

SDA concept should be considered for those patients who have shortened dental arch and on whom various treatment strategies like bridges, implants, Removable Partial Dentures (RPDs), restorations etc., are not appropriate or justified. Thus it can be considered as a treatment modality to improve the approachability for marginalized and elderly communities as suggested by many researchers [7].

In the western countries this concept appears to be widely accepted e.g., survey conducted among European dentists during the late 1990s concluded that generally, practitioners agree with the SDA concept [8,9]. Arigbede AO et al., in Nigeria in 2009 in his study also said that 36.1% of the dentists indicated that the

concept was good for developing countries like Nigeria [10]. Even the dentists of Saudi Arabia have said that SDA was considered to be a successful method which provides a satisfactory function [11]. In India, in a study among the prosthodontists of Calicut, a positive opinion about SDA concept was found [12]. Though, many Prosthodontic Association members have applied the concept but still mostly dentists are relatively inexperienced in its application [12]. There is paucity of the reports regarding knowledge and attitude of dentists regarding SDA concept. Therefore, this study was done with the aim of assessment of the KAP towards the SDA concept among them.

The objective of the study was to assess KAP regarding SDA concept among dentists in Ghaziabad, Uttar Pradesh, India and to find out the association between KAP of dentists with qualification, years of experience and difference between KAP of clinicians, academicians and both.

MATERIALS AND METHODS

A questionnaire based cross-sectional survey was carried out among the 514 dentists working as academicians or clinicians or both in and around Ghaziabad. All the registered dentists, registered at Chief Medical Office (CMO), District Hospital, Ghaziabad and the faculties working in four dental colleges around the Ghaziabad city were contacted to be part of the study.

Ethical approval was obtained from the Institutional Review Board, D.J. College of Dental Sciences and Research, Modinagar, Ghaziabad district, Uttar Pradesh, India and informed consent was taken from all the study participants prior to the study. Participation in the study was voluntary and confidentiality of data was maintained.

The questionnaire used in the study consisted of two parts. The first part included the patients' demographic data and the second one included the KAP related questions regarding SDA concept. There were 04 knowledge, 02 attitude and 03 practice related questions.

Questionnaire Validation: The questionnaire was pretested on 75 dentists who were not included in the main study and comprised 15% of the study sample for reliability and validity. Reliability of the questionnaire was assessed using test-retest and internal consistency of the questionnaire was ascertained by Chronbachs-Alpha (α). Construct validity of the questionnaire was assessed using Spearman's correlation coefficient between individual parameter/ construct and overall score of the construct.

Data Collection: The questionnaire was self administered after explaining the study design to all the dentists who consented to participate in the study. All dentists working in colleges were approached in their respective colleges. Dentists were requested to complete the questionnaire within two weeks and were reminded once before the deadline.

STATISTICAL ANALYSIS

The collected data were analyzed using Statistical Package For Social Sciences (SPSS) 18.0 (SPSS Inc., Chicago, IL, USA) and descriptive and analytical tests, including mean, standard deviation, and Chi square test.

RESULTS

The questionnaire based study was carried out among the 514 dentists regarding the KAP towards SDA concept. Reliability measured through test-retest showed measured kappa (k) of 0.86 and weighted kappa (k) of 0.9. Internal consistency measured through Chronbachs-Alpha (α) was found to be 0.78. Construct validity was assured using spearman's correlation coefficient ($p<0.001$).

A total of 493 dentists completed the questionnaire, generating the response rate of 95.5%. The study sample comprised of 239 (48.5%) males and 254 (51.5%) females. Demographic characteristics such as years of teaching/practicing experience, level of qualification, and career perspective of dentists are summarized in [Table/Fig-1].

[Table/Fig-2] present the views of all the dentists who responded to the questionnaire and among 493 dentists only 113 (22.9%) had knowledge about this concept and among these 113 dentists, majority i.e., 47 (41.6%) were aware about this concept since a decade.

Characteristics	N
Gender	
Male	239 (48.5%)
Female	254 (51.5 %)
Qualification	
BDS	169 (34.3 %)
MDS	324 (65.7%)
Years of experience (teaching/practicing)	
1-5 years	132 (26.6%)
5-10 years	233 (47.4 %)
More than 10 year	128 (26%)
Career prospective	
Academician	132 (26.8%)
Clinician	147 (29.8%)
Both	214 (43.4%)

[Table/Fig-1]: Demographic characteristic of study participants.

Questions	N (%)
Do you know about the Shortened Dental Arch (SDA) concept?	
Yes	113 (22.9%)
No	380 (77.1%)
Response of dentists regarding SDA concept who knew about it	
When did you come to know about the SDA concept?	
More than 10-15 years back	47 (41.6%)
5-10 years back	41 (36.3%)
Less than 5 years	24 (21.2%)
Now only	01 (0.9%)
What are the clinical situations you think are most apt to propose SDA to patients?	
Caries/periodontal disease confined mainly to the molar regions	34 (30.1%)
Good periodontal prognosis of the anterior and premolar regions	39 (34.5 %)
Limited possibilities of restorative care	27 (23.9 %)
No contraindications, such as young age	13 (11.5 %)
What were your patients' reactions after proposing to 'shorten' his or her dental arch?	
Objection	16 (314.2%)
Initially objections, agreed after detailed explanation	43 (38.1%)
No objection	39 (34.5%)
Don't know	15 (13.3%
Do you think individual with SDA needs further treatment?	
Yes	35 (31.0%)
No	59 (52.2%)
May be	19 (16.8%)
Do you know any of your patients who have a SDA and have received no treatment?	
Yes	57 (50.4%)
No	36 (31.9 %)
May be	20 (17.7%)
Do you think is there any change in masticatory efficiency with the SDA?	
Yes	47 (41.6%)
No	45 (39.8%)
May be	21 (18.6%)

Does the SDA lead to TMJ associated issues?	
Yes	43 (38.1%)
No	45 (39.8%)
May be	25 (22.1%)
According to you which teeth are required to meet functional demands?	
Biting	
Anterior	79 (69.6%)
Anterior +premolar +molar	16 (14.2%)
Anterior +premolar	18 (15.9%)
Chewing	
Premolar	7 (6.2%)
Molar	5 (4.4%)
Anterior +premolar +molar	10 (8.8%)
Anterior +premolar	8 (7.1%)
Premolar +molar	83 (73.5%)
Speech	
Anterior	88 (77.9%)
Premolar	2 (1.8%)
Anterior +premolar +molar	20 (17.7%)
Anterior +premolar	3 (2.7%)
Aesthetics	
Anterior	5 (4.4%)
Anterior +premolar +molar	22 (19.5%)
Anterior +premolar	86 (76.1%)
TMJ (Mandibular Stability)	
Anterior +premolar +molar	104 (92.0%)
Anterior +premolar	5 (4.4%)
Premolar +molar	4 (3.5%)
Dental arch (Occlusal Stability)	
Anterior +premolar +molar	79 (69.9%)
Anterior +premolar	20 (17.7%)
Premolar +molar	14 (12.4%)

[Table/Fig-2]: Response of dentists regarding SDA concept.

Questions	BDS (N)	MDS (N)	p-value
Do you know about the Shortened Dental Arch (SDA) concept?			
Yes	50 (10 %)	63 (12.8%)	0.008
No	119 (24%)	261 (52.2%)	
Association of level of qualification with KAP regarding SDA concept who knew about it			
When did you come to know about the SDA concept?			
More than 10-15 years back	24 (21%)	23 (20%)	0.4
5-10 years back	18 (16)	23 (20%)	
Less than 5 years	8 (7.1%)	16 (14%)	
Now only	0 (0%)	1 (0.9%)	
What are the clinical situations you think are most apt to propose SDA to patients?			
Caries/periodontal disease confined mainly to the molar regions	12 (10.6%)	22 (19.7%)	0.4
Good periodontal prognosis of the anterior and premolar regions	20 (17.7%)	19 (16.8%)	
Limited possibilities of restorative care	11(9.7%)	16 (14%)	
No contraindications, such as young age	07 (6.2%)	6 (5.3%)	
What were your patients' reactions after proposing to 'shorten' his or her dental arch?			
Objection	5 (4.5%)	11(9.8%)	0.3
Initially objection, agreed after detailed explanation	23 (20%)	20 (17.7%)	
No objection	17 (15%)	22 (19.7%)	
Do not know	5 (4.5%)	10 (8.8%)	
Do you think individual with SDA needs further treatment?			
Yes	18 (16%)	17 (15%)	0.5
No	24 (21.1%)	35 (31.0%)	
May be	8 (7.1%)	11 (9.8%)	
Do you know any of your patients who have a SDA and have received no treatment?			
Yes	22 (19.7%)	35 (31.0%)	0.3
No	19 (16.8%)	17 (15%)	
May be	9 (7%)	11 (9.7%)	
Do you think is there any change in masticatory efficiency with the SDA?			
Yes	22 (19.7%)	25 (22 %)	0.5
No	21 (18 %)	24 (21%)	
May be	7 (7%)	14 (12.3%)	
Does the SDA lead to TMJ-associated issues?			
Yes	20 (17.7%)	23 (20.3%)	0.9
No	19 (16.8%)	26 (23.2%)	
May be	11 (9.7%)	14 (12.3%)	
According to you which teeth are required to meet functional demands?			
Biting			
Anterior	35 (31%)	44 (38.9%)	0.9
Anterior +premolar +molar	8 (7.2%)	8 (7%)	
Anterior +premolar	7 (6.2%)	11 (9.7%)	
Chewing			
Premolar	1 (0.9%)	6 (5.3%)	0.09
Molar	0 (0%)	5 (4.4%)	
Anterior +premolar +molar	5 (4.4%)	5 (4.4%)	
Anterior +premolar	5 (4.4%)	3 (2.7%)	
Premolar +molar	39 (34.6%)	44 (38.9%)	
Speech			
Anterior	45 (39.1%)	43 (38%)	0.04
Premolar	1 (0.9%)	2 (1.8%)	
Anterior +premolar +molar	4 (3.5%)	16 (14%)	
Anterior +premolar	1 (0.9%)	2 (1.8%)	
Aesthetics			
Anterior	3 (2.7%)	2 (1.8%)	0.02
Anterior +premolar +molar	15 (13.2%)	7 (6.2%)	
Anterior +premolar	32 (28.3%)	54 (47.8%)	
TMJ (Mandibular Stability)			
Anterior +premolar +molar	49(43.4%)	55(48.6%)	0.08
Anterior +premolar	0	5(4.4%)	
Premolar +molar	1(0.9%)	3(2.7%)	
Dental arch (occlusal stability)			
Anterior +premolar +molar	28(24.8%)	51(45.1%)	0.00
Anterior +premolar	8(7.7%)	12(10%)	
Anterior +molar	14(12.4%)	0(0%)	

[Table/Fig-3]: Association of level of qualification with KAP regarding SDA concept. *p< 0.05 statistically significant

[Table/Fig-3] explains the association of level of qualification with KAP regarding SDA concept. Postgraduates were more aware regarding the requirement of minimum number of teeth to meet functional demands and the difference was found to be statistically significant (p< 0.05).

[Table/Fig-4] shows the association of teaching /practicing experience with KAP regarding SDA concept. It was seen that dentists who had experience of 1-5 years were more aware. According to them, there is no change in masticatory efficacy with shortened dental arch and patients with shortened dental arch do not require further treatment. The difference was found to be statistically significant (p< 0.05).

Questions	1-5 years	5-10 years	More than 10 years	p-value
Do you know about the Shortened Dental Arch (SDA) concept?				
Yes	85 (17.3%)	28 (5.7%)	0 (0%)	<0.001
No	46 (9.3%)	205 (41.6%)	128 (25.7)	
Association of years of experience with KAP regarding SDA concept who knew about it				
When did you come to know about the SDA concept?				
More than 10-15 years back	36 (31.3%)	12 (10.6%)	0 (0%)	0.02
5-10 years back	35 (30.9%)	6 (5.3%)	0 (0%)	
Less than 5 years	14 (12.3%)	10 (8.8%)	0 (0%)	
Now only	0 (0%)	1 (.8%)	0 (0%)	
What are the clinical situations you think are most apt to propose SDA to patients?				
Caries/periodontal disease confined mainly to the molar regions	21 (18.8%)	13 (11.5%)	0 (0%)	0.1
Good periodontal prognosis of the anterior and premolar regions	30 (26.5%)	9 (8%)	0 (0%)	
Limited possibilities of restorative care	23 (20%)	4 (3.6%)	0 (0%)	
No contraindications, such as young age	11 (9.8%)	2 (1.8%)	0 (0%)	
What were your patients' reactions after proposing to 'shorten' his or her dental arch?				
Objection	10 (8.8%)	6 (5.3%)	0 (0%)	0.6
Initially objections, agreed after detailed explanation	33 (29.2%)	10 (8.8%)	0 (0%)	
No objection	30 (26.5%)	9 (8%)	0 (0%)	
Do not know	12 (10.6%)	3 (2.8%)	0 (0%)	
Do you think individual with SDA needs further treatment?				
Yes	20 (17.6%)	15 (13%)	0 (0%)	0.006
No	51 (45.0%)	8 (7.7)	0 (0%)	
May be	14 (12.3%)	5 (4.4%)	0 (0%)	
Do you know of any of your patients who have a SDA and have received no treatment?				
Yes	42 (37.1%)	15 (13.3%)	0 (0%)	0.5
No	26 (23%)	10 (8.8%)	0 (0%)	
May be	17 (15%)	3 (2.8%)	0 (0%)	
Do you think is there any change in masticatory efficiency with the SDA?				
Yes	30 (26.5%)	37 (32.7%)	18	0.05
No	37 (32.7%)	8 (7.7%)	3	
May be	18 (15.9%)	0 (0%)	0 (0%)	
Does the SDA lead to TMJ-associated issues?				
Yes	35 (31%)	8 (7.7%)	0 (0%)	0.09
No	29 (25.6%)	16 (14%)	0 (0%)	
May be	21 (18.2%)	4 (3.5%)	0 (0%)	
According to you which teeth are required to meet functional demands?				
Biting				
Anterior	60 (53%)	19 (16.9%)	0 (0%)	0.3
Anterior +premolar +molar	10 (8.8%)	6 (5.3%)	0 (0%)	
Anterior +premolar	15 (13.3%)	3 (2.7%)	0 (0%)	
Chewing				
Premolar	6 (5.3%)	1 (0.8%)	0 (0%)	<0.001
Anterior +premolar +molar	10 (8.8%)	5 (4.4%)	0 (0%)	
Anterior +premolar	8 (7.6%)	0 (0%)	0 (0%)	
Premolar +molar	61 (54.0%)	22 (19.1%)	0 (0%)	
Speech				
Anterior	60 (53%)	28 (24.8%)	0 (0%)	0.01
Premolar	2 (1.8%)	0 (0%)	0 (0%)	
Anterior +premolar +molar	20 (17.8%)	0 (0%)	0 (0%)	
Anterior +premolar	3 (2.6%)	0 (0%)	0 (0%)	
Aesthetics				
Anterior +premolar +molar	5 (4.4%)	0 (0%)	0 (0%)	0.003
Anterior +premolar	22 (19.5%)	0 (0%)	0 (0%)	
Premolar +molar	58 (51.1%	28 (25%)	0 (0%)	
TMJ (Mandibular Stability)				
Anterior	79 (70%)	25 (22%)	0 (0%)	0.7
Anterior +premolar +molar	3 (2.7%)	2 (1.8%)	0 (0%)	
Anterior +premolar	3 (2.7%)	1 (0.8%)	0 (0%)	
Dental arch (Occlusal Stability)				
Anterior +premolar +molar	59 (52%)	20 (17.6%)	0 (0%)	0.002
Anterior +premolar	12 (10.5%)	08 (7.6%)	0 (0%)	
Premolar +molar	14 (12.3%)	0 (0%)	0 (0%)	

[Table/Fig-4]: Association of years of experience with KAP regarding SDA concept. *p< 0.05 statistically significant

Questions	Clinician	Academician	Both	p-value
Do you know about the Shortened Dental Arch (SDA) concept?				
Yes	57 (11.6%)	57 (11.6%)	25 (5%)	0.00
No	75 (15.2%)	75 (15.2%)	189 (38.4%)	
Association of academician, clinician or both with KAP regarding SDA concept who knew about it				
When did you come to know about the SDA concept?				
More than 10-15 years back	23 (20.4%)	14 (12.4%)	10 (9%)	0.1
5-10 years back	17 (15%)	10 (9%)	14 (12.4%)	
Less than 5 years	16 (14%)	7 (6%)	1 (0.9%)	
Now only	1 (0.9%)	0 (0%)	0 (0%)	
What are the clinical situations you think are most apt to propose SDA to patients?				
Caries/periodontal disease confined mainly to the molar regions	17 (15%)	6 (5.3%)	11 (9.7%)	0.2
Good periodontal prognosis of the anterior and premolar regions	21 (18.6%)	10 (9%)	8 (7%)	
Limited possibilities of restorative care	15 (13.3%)	9 (8%)	3 (2.6%)	
No contraindications, such as young age	4 (3.5%	6 (5.3%)	3 (2.6%)	
What were your patients' reactions after proposing to 'shorten' his or her dental arch?				
Objection	9 (8%)	4 (3.5%)	3 (2.6%)	0.6
Initially objection, agreed after detailed explanation	23 (20.4%)	14 (12.4%)	6 (5.3%)	
No objection	18 (16%)	10 (9%)	11 (9.7%)	
Do not know	07 (6.1%)	3 (2.6%)	05 (4.4%)	
Do you think individual with SDA needs further treatment?				
Yes	24 (21.2%)	07 (6.2%)	4 (3.5%)	0.01
No	25 (22.2%)	18 (16%)	16 (14.2%)	
May be	08 (7%)	6 (5.3%)	5 (4.4%)	
Do you know of any of your patients who have a SDA and have received no treatment?				
Yes	31 (27.5%)	15 (13.2%)	11 (9.7%)	0.00
No	21 (18.6%)	5 (4.4%)	10 (9%)	
May be	05 (4.4%)	11 (9.7%)	4 (3.5%)	

Do you think is there any change in masticatory efficiency with the SDA?				
Yes	26 (23%)	13 (11.5%)	8 (7.1%)	0.03
No	18 (16%)	13 (11.5%)	14 (12.3%)	
May be	13 (11.5%)	5 (4.4%)	3 (2.7%)	
Does the SDA lead to TMJ-associated issues?				
Yes	23 (20.3%)	8 (7%)	12 (10.6%)	0.03
No	27 (23.9%)	13 (11.5%)	5 (4.4%)	
May be	07 (6.2%)	10 (9%)	8 (7.1%)	
According to you which teeth are required to meet functional demands?				
Biting				
Anterior	40 (35.4%)	18 (16%)	21 (18.6%)	0.1
Anterior +premolar +molar	9 (8%)	4 (3.5%)	3 (2.6%)	
Anterior +premolar	8 (7%)	9 (8%)	1 (0.9%)	
Chewing				
Premolar	5 (4.4%)	2 (1.8%)	0 (0%)	0.1
Molar	5 (4.4%)	0 (0%)	0 (0%)	
Anterior +premolar +molar	2 (1.8%)	3 (2.7%)	5 (4.4%)	
Anterior +premolar	4 (3.5%)	3 (2.7%)	1 (0.9%)	
Premolar +molar	41 (36.3%)	23 (20.3%)	19 (16.8%)	
Speech				
Anterior	88 (77.8%)	0 (0%)	0 (0%)	0.8
Premolar	2 (1.8%)	0 (0%)	0 (0%)	
Anterior +premolar +molar	20 (17.7%)	0 (0%)	0 (0%)	
Anterior +premolar	3 (2.7%)	0 (0%)	0 (0%)	
Aesthetics				
Anterior	2 (1.8%)	1 (0.9%)	2 (1.8%)	0.2
Anterior +premolar +molar	7 (6.2%)	8 (7%)	7 (6.2%)	
Anterior +premolar	48 (42.6%)	22 (19.4%)	16 (14.1%)	
TMJ (Mandibular Stability)				
Anterior +premolar +molar	52 (46%)	27 (23.9%)	25 (22.2%)	0.003
Anterior +premolar	5 (4.4%)	0 (0%)	0 (0%)	
Premolar +molar	0 (0%)	4 (3.5%)	0 (0%)	
Dental arch (Occlusal Stability)				
Anterior +premolar +molar	39 (34.5%)	24 (21.2%)	16 (14.4%)	0.7
Anterior +premolar	11 (9.7%)	3 (2.7%)	6 (5.2%)	
Anterior +molar	7 (6.1%)	4 (3.5%)	3 (2.7%)	

[Table/Fig-5]: Association of academician, clinician or both with KAP regarding SDA concept.
*p< 0.05 statistically significant

[Table/Fig-5] explains the association of academician, clinician or both with KAP regarding SDA concept and majority of clinicians showed positive attitude regarding the SDA concept. Majority of the clinicians said that SDA doesn't lead to TMD and patients with SDA do not require further treatment. The difference was found to be statistically significant (p< 0.05).

DISCUSSION

Due to various oral diseases like periodontitis and dental caries, molars are often lost earlier than any other tooth leading to shortening of dental arch and thus the treatment and resources should be directed to anterior and premolar teeth making them functionally durable as the masticatory system is adaptable in nature [6,7].

In this study it was seen that majority i.e., 65.7% were MDS and among them 43.4% were both academician and clinician but only 22.9% of all the dentists studied were aware of SDA concept and results are in agreements with study done by Allen PF et al., in 1996 in UK, where SDA is widely accepted but not widely practiced [9]. This could be due to the reason that SDA concept is not well known or may be due to lackness of current evidence based treatment approaches [8,9].

In the study done by Vohra F et al., in Saudi Arabia in 2015, 53.9% of the specialists applied SDA concept in only less than 10% of their patients. Also, the SDA concept was never applied in their practice by 54.8% residents and 46.6% of general dental practitioners [11].

In the present study 38.1% of dentists with knowledge regarding SDA concept, said initially their patients had objections but agreed after explanation regarding shortening of his/her dental arch for the treatment purpose. The findings are similar to the study conducted by Kumar PC et al., in 2010 where it was found that 57% of the patients either had no objection or initially objected to SDA but later agreed following detailed explanation [12].

The presence of approximately 10 pairs of occluding anterior and premolar teeth and having less dysfunction or ill health with limited possibilities for extensive restorative care [6]. Even in this study also, majority i.e., 52.2% dentists who knew about SDA concept believed that patient with SDA do not need further treatment and 50.4% patients with SDA who came across the dentists in our study had not received treatment.

Many studies have shown that there is association of reduced eating ability and TMJ discomfort in patients with SDA but researches have proved it wrong as satisfactory chewing ability is perceived as long as the dental arch comprise an intact anterior region and occluding pairs of posterior teeth [7]. Moreover, in this study also, only 41.6% dentists with knowledge of SDA concept believed that there is change in masticatory efficiency with SDA and only 39.8% of the dentists have said that there was no Temporomandibular Joint Disorders (TMD) associated issues in the patients with SDA and the difference was found to be statistically significant (p<0.05) between clinicians, academicians and both. The results are more or less in agreement with study done by Vohra F et al., in Saudi Arabia in 2015 where 76.4% dentists believed shortened dental arch provided satisfactory or acceptable function, 76.1% and 76.8% dentists believed SDA provided aesthetics and comfort respectively and also a significant difference between the opinions of Specialists (SP), General Dental Practitioners (GDP), and Residents (RES), regarding the effect of SDA on aesthetics (p=0.039), tooth wear (p<0.001), TMD (p<0.001), and tooth migration p=0.002) was seen [11]. But Nassani MZ et al., in Syria in 2015 through their study said that there were no significant differences in dentists' attitudes towards SDAs of varying arch length [13].

In this study, significant association was found between the level of qualification and knowledge regarding minimum number of teeth required to meet functional demands. Significant difference (p<0.05) in knowledge was also seen among the clinicians, academicians and both, and years of experience. Clinicians with 1-5 years of experience had positive attitude towards SDA concept but are not incorporating this concept in their clinical practice. This may be due to fear of losing income [8].

Our study showed majority (77.1%) of the dentists were unaware of the SDA concept. Also of the few dentists aware of the SDA concept majority were not practicing it in their field due to limited knowledge regarding it; implying lack the knowledge regarding recent developments and evidence in the field of dentistry as SDA is relatively a new concept. Therefore, SDA concepts need to be promoted as this is relevant for many developing countries as it offers a functional approach at lesser cost [3].

It is recommended that the postgraduate training in dentistry should be based on best available current evidence to align the practice of SDA in trainees and for further future practices.

Along with training regarding SDA, it should be employed on the treatment plan for every patient who has a shortened dental arch. Though it may not be used each time but thought should be given to each and every individual as each patient has a unique situation and they need to be treated uniquely.

LIMITATION AND RECOMMENDATION

Till date most of the studies regarding this concept have been carried out in other countries and majority of them were on prosthodontists, very limited studies have been done in our country and none of them on general practitioners. Therefore, there was not much literature available for comparison of this study which proved a major limitation. Also, further studies involving larger sample size should be carried out to elucidate the knowledge and importance of SDA in comparison to other treatment modalities.

CONCLUSION

Dentists having knowledge regarding SDA concept are scarce. Dentists are not applying SDA in their day to day practice due to lack of awareness and knowledge. SDA provides the oral comfort, hygiene and the functional dentition at reduced cost without compromising the patient's health. Therefore, it should be on treatment list of each dentist because it's a simple as well as qualitative approach. So, each dentist has to plan the treatment by keeping SDA concept in his mind.

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