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ORIGINAL ARTICLE

Knowledge, Attitude and Practice of Dentists Towards Resin Bonded Bridges Across Pakistan

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ABSTRACT

Objective: The object of this survey study was to assess the knowledge, attitude and practice of dentists towards resin bonded bridges across Pakistan.

Methodology: A cross-sectional survey study was conducted. A self-administered questionnaire was distributed among 500 dentists across Pakistan as a google form through electronic media. The questionnaire had three sections. First two sections had details about purpose of study and demographic details respectively. In the third section knowledge, attitude and practice of the participants were assessed. Knowledge and attitude were scored. Level of knowledge and attitude towards use of RBBs was correlated with other variables. Significance of factors related to RBB success was evaluated as percentages.

Results: A total of 162 males (78%) and 128 females (63.1%) had adequate knowledge. Overall, 303 (75.2%) participants were inclined to use the RBB while only 100 (24.8%) were not in the favor of using this treatment. 286 participants (71%) were confident to offer this treatment to their patients however, 85% of them actually employed RBBs for ≤ 20% of their tooth replacements. Lack of skills was considered as a major hindrance to employ RBB treatment followed by the lack of technical support.

Conclusion: The results of the study showed that participants are poised in knowledge regarding RBBs but they are reluctant to use this confidently because of lack of practical skills. Modest use of RBB in clinical practice is a question mark and a food for thought.

Keywords: Resin Bonded Bridges, Conservative Dentistry, Minimally Invasive Dentistry.

INTRODUCTION

The concept of minimal intervention dentistry has gained immense popularity over the past few years.[1] Resin bonded bridges (RBBs) offer a conservative and cost-effective means for replacement of short spans or a single tooth compared to conventional bridges and implant supported prosthesis.[2, 3] In 1973 Rochette introduced the concept of bonding a metal retainer to enamel using adhesive resin, his application was to splint periodontally compromised teeth.[1, 4-7] The initial RBBs demonstrated poor longevity however, they have evolved over time and current clinical evidence suggests predictable long term success and patient satisfaction with their use.[7]

Resin bonded bridges are minimally invasive, allow for preservation of tooth structure, preservation of pulp vitality, minimal soft tissue interaction and catastrophic failure, treatment reversibility, and ease of retrievability. Despite all, they are infrequently prescribed and have an undeserved reputation for failure.[1,8] The failure can be due to biological (caries, periodontal disease), mechanical (debonding, fracture) or esthetic reasons separately or in combination.[5] Previously reported high failure rates could be attributed to unsuitable case selection, unfavourable design, and inappropriate cementation protocol.[7]

RBBs have an important place in restorative dentistry, with their indications extending beyond temporary replacement of teeth. Careful case selection is important. Established standards related to the design and retainers of RBB for clinical success include: increased longevity for cantilever design, maximum enamel coverage by retainer, use of sandblasted and non-perforated retainers, use of nickel chrome alloy framework and none or minimal preparation with preservation of enamel thickness.[3,5,7,9,10] In addition a minimum retainer thickness of 0.7 mm, a minimum connector height of 2 mm and use of resin-based cement with rubber dam isolation have been reported as essential factors to minimise complications.[5,9,11]

Debonding of RBBs is the biggest disadvantage, still they show reasonable survival rates with systematic reviews estimating 5 years survival rate for RBBs at 87.7%, compared to conventional bridges at just over 90% and 94.5% for implant retained single crowns.[11-15] Balasubramaniam revealed the predicted 5 and 10 year survival rates of RBBs to be 83.6% and 64.9% respectively.[11] Survival rates vary between studies from 74-95% due to difference in factors that affect success and difference in follow up times.[12,13] Thoma et al. estimated a 91.4% survival after 5 years and 82.9% after 10 years.[14] However, it is important to understand that debonding may not be an absolute failure, as function and aesthetics can be restored by rebonding.[15]

In clinical practice, RBBs use is infrequent because of concerns over their reliability as a replacement option. This prevailing uncertainty among the dentists may be multifactorial. It is important to ascertain the reason, which can simply be lack of knowledge and clinical skills, poor case selection or lack of technical support and to address it. The aim of the study is to evaluate the knowledge and perception of dentists towards RBB use for the replacement of missing teeth and to find reasons for their limited clinical application. To the researcher's best knowledge, little research has been done in Pakistan so far.

MATERIAL AND METHODS

This self-administered questionnaire based cross-sectional survey was conducted across Pakistan. The sample size was calculated using WHO calculator keeping the confidence level as 95% and absolute precision as 0.05. General dental practitioners, specialists (prosthodontists and operative dentists) and residents under training in prosthodontics and operative dentistry were included in the study. Ethical approval was obtained from the Institutional Review Board (IRB) at CMH Lahore Medical College & Institute of Dentistry, Case #.516/ERC/CMH/LMC. The questionnaire was circulated as a google form through electronic media i.e., e-mail, messages, and WhatsApp groups. Electronic consent was taken from the participants. The data collection tool was anonymous and the participation in the survey was on a voluntary basis.

The questionnaire was developed after intense literature search and review of some previously used questionnaires. It has three sections with 26 questions. The first section of the questionnaire described the purpose of the study followed by an electronic consent. In the second section, 8 questions were about the demographic details of the respondents/ participants. Whereas, in the third section, respondent's awareness regarding RBBs, their knowledge along with attitude and practice towards RBBs was assessed.

All the returned survey forms were analysed. Data was transferred into SPSS version 22. For 15 questions of the knowledge section, the score range was between 0-15. A score of 0-9 was considered as inadequate/low level of knowledge whereas a score between 10-15 was considered as adequate/high level of knowledge. For the attitude section, there were a total of 6 questions. Score range was between 0-6. Score of 0-3 was considered as "not inclined to" use of RBBs and score between 4-6 was considered as "inclined to" use of RBBs. The categorization was done on the basis that currently worldwide a minimum of above 60% score is required to qualify any exam.

Level of knowledge and attitude towards use of RBBs was correlated with other variables namely gender, age, highest qualification, field of specialty, current working position, and years in dental practice by applying the Chi-square test of association for each variable separately. The frequency, percentages and the corresponding p-values were calculated within each demographic variable. A p-value of ≤ 0.05 was considered as significant. The association between knowledge and attitude was also explored. The percentages were calculated within knowledge groups. Significance of factors related to success of RBB ranging between very insignificant to very significant was evaluated as percentages.

RESULTS

A total of 500 forms were sent, whereby received responses were 403 (80.6%). Out of which 19 were excluded based on the exclusion criteria which was, fresh graduates undergoing house job training. Among the 403 responses included in the study, 203 (50.4%) participants were female, whereas 200 (49.6%) were males. Almost equal number of respondents i.e., 38% belonged to the age group of 26-30 years (154) and 31-40 years (153). (Figure 1)

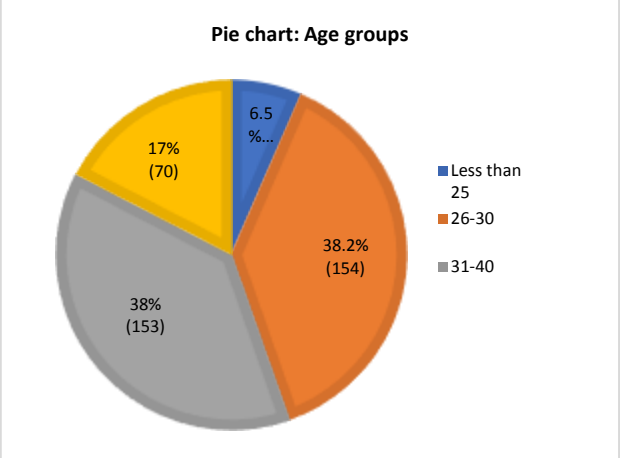

Figure 1: Age Groups

Among the various provinces of Pakistan, maximum respondents 46.4% (187) were from Punjab, followed by Khyber Pakhtunkhwa 21.3% (86), Sindh 14% (56), and Balochistan 12.2% (49) respectively. Among the participants 50.9% (205) were working at private institutions followed by 19.6% (79) working at government institutions, 14.9% were working at an institution as well as doing private practice and 14.6% (59) were doing private practice only. Bachelor of Dental Surgery was the highest qualification of most respondents 40% (161) followed by 29.3% (118) who had postgraduate degree i.e. Fellowship as their highest qualification.

The highest percentage of participants 128 (31.8%) were prosthodontists, followed by 121(30%) general dentists, and 80 (19.9%) operative dentists. (Figure 2)

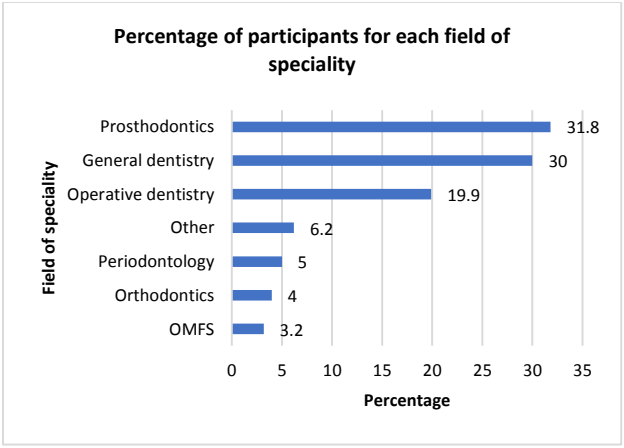

Figure 2: Percentage of Participants for each field of speciality

The participants of the study had been in dental practice for varied durations starting from two to more than 10 years. The distribution as per years in dental practice can be seen in Figure 3.

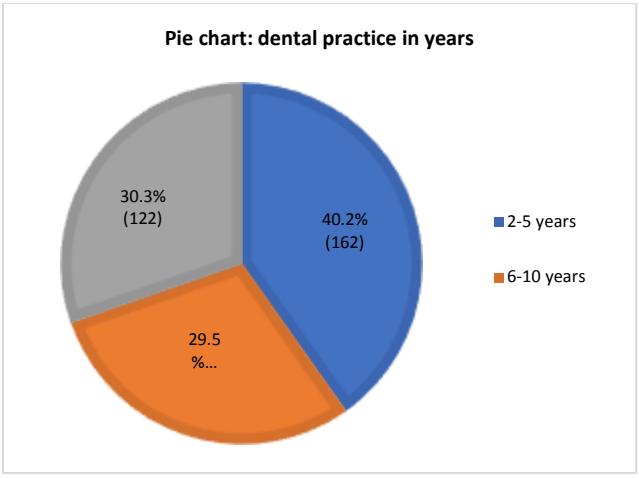

Figure 3: Dental practice in years

Maximum respondents reported gaining knowledge about RBBs during their undergraduate dental programs followed by those who learnt about them in their postgraduate dental programs. Very few 19.6% learnt about them from continuing education programs and 6.2% (25) learnt about RBBs from advertisements. The total knowledge score was categorised into inadequate (0-9) and adequate (10-15) knowledge. (Figure 4).

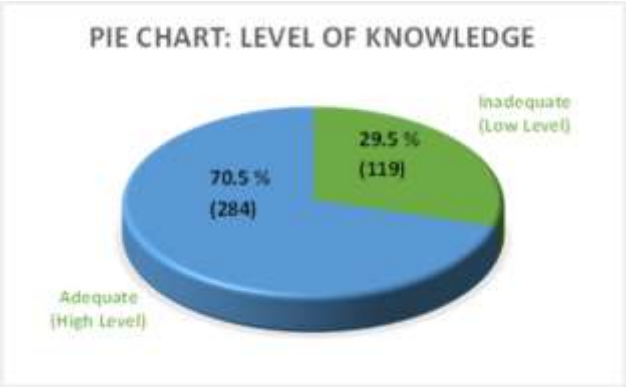

Figure - 4: Level of Knowledge

A total of 162 males (78%) and 128 females (63.1%) had adequate knowledge. The participants older than 40 years contributed to the maximum percentage of adequate knowledge participants (78.6%) followed by the age group 31-40 years (76.5%). This result was endorsed by the years in dental practice as 96 (78.7%) participants with more than 10 years of dental experience had adequate knowledge. Similarly, 103 (87.3%) Fellowship holders had adequate knowledge followed by 69.6% of BDS and 65.7% of M.Sc. and 65.7% of MCPS holders. For the field of specialty, the maximum adequate knowledge was reported by the Prosthodontists i.e., 107 (83.6%) followed by 62 (77.5%) Operative Dentists and then General Dentists (63.6%). Among the respondents, consultants (83%) had the highest level of knowledge about RBBs followed by senior registrars (77.8%) and then residents / trainees (65.4%).

The frequency, percentages and the corresponding p-values were tabulated (Table 1). The percentages were calculated within each category of the variables.

Overall, 303 (75.2%) participants were inclined to use the RBB while only 100 (24.8%) were not in the favour of using this treatment. The attitude groups were significantly associated with the highest qualification, field of specialty, and currently working while no significant association was observed with the variables gender, age, and years in dental practice.

The participants with Fellowship degree (88.1%) were found most inclined towards RBB use when inclination was assessed at various qualification levels. Equal percent of Prosthodontists and Operative Dentists i.e., 87.5% showed inclination to use RBBs. Residents/ Trainees (81.5%) and Consultants (81.1%) were most inclined towards using RBBs as a treatment option. Among the province's dentists from KPK (81.4%) were found to be most inclined towards RBB use followed by dentists from Balochistan (79.6%) and then from Punjab (73.8%).

Table 1: The association of knowledge level and attitude towards RBB with gender, age, highest qualification, field of specialty, current designation, and years in dental practice.

Variables / Categories	Knowledge level			p-value	Attitude towards use of RBB		p-value
	Inadequate	Adequate	Total		Not inclined to use	Inclined to use	
Gender							
Male	44 (22%)	156 (78%)	200	0.001*	44 (22%)	156 (78%)	0.194
Female	75 (36.9%)	128 (63.1%)	203		56 (27.6%)	147 (72.4%)	
Age							
<= 25	13 (50%)	13 (50%)	26	0.005*	5 (19.2%)	21 (80.8%)	0.638
26-30	55 (35.7%)	99 (64.3%)	154		43 (27.9%)	111 (72.1%)	
31-40	36 (23.5%)	117 (76.5%)	153		37 (24.2%)	116 (75.8%)	
> 40	15 (21.4%)	55 (78.6%)	70		15 (21.4%)	55 (78.6%)	
Highest qualification							
Ph.D.	3 (42.9%)	4 (57.1%)	7	< 0.001*	2 (28.6%)	5 (71.4%)	0.002*
FCPS	15 (12.7%)	103 (87.3%)	118		14 (11.9%)	104 (88.1%)	
MDS	8 (40%)	12 (60%)	20		3 (15%)	17 (85%)	
M.Sc.	12 (34.3%)	23 (65.7%)	35		15 (42.9%)	20 (57.1%)	
MCPS	12 (34.3%)	23 (65.7%)	35		10 (28.6%)	25 (71.4%)	
BDS	49 (30.4%)	112 (69.6%)	161		48 (29.8%)	113 (70.2%)	
Other	20 (74.1%)	7 (25.9%)	27		8 (29.6%)	19 (70.4%)	
Field of specialty							
General dentistry	44 (36.4%)	77 (63.6%)	121	< 0.001*	40 (33.1%)	81 (66.9%)	<.001*
Prosthodontics	21 (16.4%)	107 (83.6%)	128		16 (12.5%)	112 (87.5%)	
Operative dentistry	18 (22.5%)	62 (77.5%)	80		10 (12.5%)	70 (87.5%)	
Orthodontics	7 (43.8%)	9 (56.3%)	16		4 (25%)	12 (75%)	
Oral surgery	6 (46.2%)	7 (53.8%)	13		6 (46.2%)	7 (53.8%)	
Periodontology	8 (40%)	12 (60%)	20		14 (70%)	6 (30%)	
Other	15 (60%)	10 (40%)	25		10 (40%)	15 (60%)	
Current designation							
Lecturer/demonstrator	45 (37.8%)	74 (62.2%)	119	0.004*	31 (26.1%)	88 (73.9%)	0.005*
Resident/trainee	28 (34.6%)	53 (65.4%)	81		15 (18.5%)	66 (81.5%)	
Senior registrar	12 (22.2%)	42 (77.8%)	54		14 (25.9%)	40 (74.1%)	
Consultant	18 (17%)	88 (83%)	106		20 (18.9%)	86 (81.1%)	
Other	16 (37.2%)	27 (62.8%)	43		20 (46.5%)	23 (53.5%)	
Dental practice							
2-5 years	65 (40.1%)	97 (59.9%)	162	0.001*	46 (28.4%)	116 (71.6%)	0.309
6-10 years	28 (23.5%)	91 (76.5%)	119		29 (24.4%)	90 (75.6%)	
> 10 years	26 (21.3%)	96 (78.7%)	122		25 (20.5%)	97 (79.5%)	

The association between knowledge and attitude was statistically significant (p-value 0.001).

Table 2: The association between knowledge and attitude, cross tabulation.

Knowledge	Attitude towards use of RBB		Total	Chi-square p-value
	Not inclined to use	Inclined to use		
Inadequate	43 (36.1%)	76 (63.9%)	119	0.001*
Adequate	57 (20.1%)	227 (79.9%)	284	
Total	100	303	403	

Out of the total 403 respondents, 286 (71%) were confident to offer this treatment to their patients; however, 85% of them employed RBBs for ≤ 20% of their tooth replacements. Only 15 (3.7%) employed RBBs to 31-40% of their tooth replacements. Lack of skills was considered as a major hindrance to employ RBB treatment followed by the lack of technical support (Figure 5).

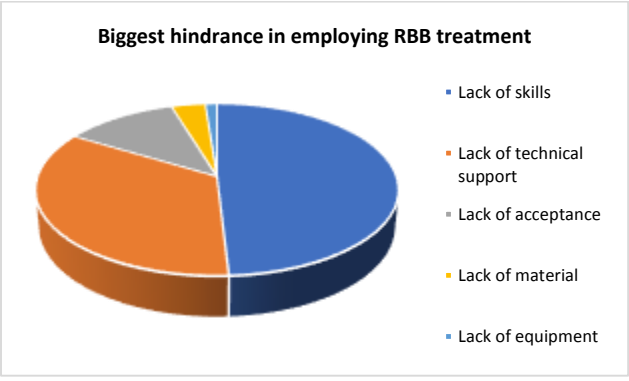

Figure 5: Pie- chart biggest hindrance in employing RBB as a treatment option.

Remaining enamel, RBB design, number of missing teeth, type of cement used, and region of mouth were reported by participants as the significant factors. The use of rubber dam, thickness and type of retainer and the height of connector did not gain much votes as being significant for clinical success. (Figure 6)

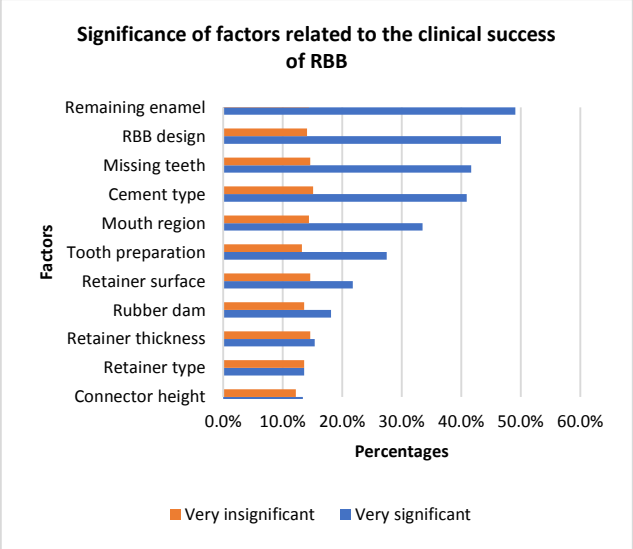

Figure 6: Clustered bar chart of factors with the percentages of very significant and very insignificant.

DISCUSSION

In this study the knowledge, attitude and practice of dentists towards RBBs across Pakistan was evaluated using a self-administered questionnaire and an attempt was made to find the reason for their limited clinical application. Resin bonded bridges offer a conservative and cost-effective means for replacement of short spans or single missing tooth.[2,3] Their advantages include safeguarding tooth structure and pulp vitality, negligible soft tissue interaction and catastrophic failure, treatment reversibility and ease of retrievability.[3,4,5] Dentists are often hesitant to provide RBBs because of the fear that the restoration might fail. However, awareness regarding RBB use as a permanent treatment option has undoubtedly increased over the past many years because conventional bridges provide an irreversible treatment option for tooth replacement and require significant tooth preparation.

In the present study maximum respondents reported gaining knowledge about RBBs during their undergraduate and postgraduate dental programs. Very few learnt about them from continuing education programs and other sources. In another study done on Yemeni dental practitioners 84% participants reported to have acquired their knowledge from Faculty whereas 16% picked it up from other resources.[16]

Adequate knowledge about RBBs was observed among the study participants. This leads to the understanding that sufficient knowledge about RBBs is being imparted in undergraduate and postgraduate dental programs. Adequate knowledge about the factors that affect the performance of RBBs is undoubtedly a key factor for its successful application. Older age group respondents, those in the 31-40 years group and those above 40 years showed higher levels of knowledge which could be attributed to their clinical experience and years in dental practice.

Prosthodontists and operative dentists (specialists) had better knowledge compared to general dentists in the current study. This observation is consistent with the results of study by Vohra et al who also found statistically significant difference between the responses of GDPs and SPs regarding their knowledge of performance factors for RBBs.[2] In another study knowledge about RBBs was compared among undergraduate senior dental students and general dental practitioners and no significant difference was observed in level of knowledge.[3] It was observed in this study that participants who have specialised (Consultants & SRs) and those undergoing the process (PGR) are conscious and well aware of the importance of preservation of the natural tooth structure. In a study it was observed that GDPs who had received Minimally Invasive Dentistry training showed significantly better knowledge and attitude in adopting minimally invasive techniques than those who had not received any such training.[17]

Expanding and refining of skills is a requisite for the changing demands of dental education and research.[18] Dentists must opportunely decline previously gained knowledge and skills and grasp new ones as part of their continuous professional growth.[19] The latest trends are towards “Integrated Conservative Oral Healthcare” also referred to as “ConsCare”.[20] This emphasis on conservation in current teaching programs, encourages the dentists to select least invasive treatment options like RBBSs which provide aesthetics and are acceptable to the patient.

The association between knowledge and attitude was found to be statistically significant (p-value < 0.001) in this study. Those having adequate knowledge were inclined towards use of RBBs. A high number of participants (71%) reported being confident to offer this treatment to their patients yet surprisingly, 85% of them actually used RBBs for ≤ 20% of their tooth replacements whereas only 3.7% employed RBBs for 31-40% of their tooth replacements. The results of another study done on resident doctors’ regarding their perception and practice of resin-bonded bridges were quite similar to present study.[21] Among the participants of the said study which included general dentist and undergraduate senior dental students, 80% indicated that less than 10% of their tooth replacement service was done with RBBs.[21] In another study only 50% participants demonstrated confidence in offering RBBs to their patients when required.[3] In yet another study a majority (65.3%) of the subjects reported using RBBs in less than 10% of their prosthodontic cases.[2] There is need for continuing education and improved exposure of undergraduate and postgraduate students to clinical application of RBBs,[21] which will help in imparting confidence among dentists for the use of RBBs in routine practice.

In the present study almost half of the respondents (49.1%) reported lack of skills as the major hindrance for employing RBBs as a treatment option in their clinical practice. Madfa et al. also reported lack of skill and training as the major factors for infrequent use of RBBs which is consistent with the results of our study.[16] In a study done in Asir region in Saudi Arabia 50% of general dental practitioners and senior dental students were not confident about providing RBBs to the patients and lack of education and training were cited as the main reasons by the participants.[3] RBBs were not used widely in clinical practice due to concerns regarding the reliability of this treatment.[3] In another study, poor retention was given as the most common reason for not using RBBs.[2]

An important hindrance reported by dentists in this study in employing RBBs in their clinical practices was lack of technical support, which is a valid concern but surprisingly was not brought to light in the various studies conducted earlier. Technique sensitivity and RBBs being short term replacement were perceived as other possible reasons for employing RBBs less in clinical practice in previous studies.[2,3] The difference could be due to the lack of awareness among the technical staff about the usefulness of RBBS. To address this issue, it is desirable to have continuous training programs for the technical staff.

In current study, the participants voted for remaining enamel (49.1%), RBB design (46.7%), number of missing teeth (41.7%), type of cement used (40.9%) and retainer type (39.2%) as very significant factors in the clinical success of RBBs. Whereas, connector height (58.6%), retainer thickness (52.6%), retainer surface treatment (48.9%), tooth preparation (46.2%), region of mouth (39.5%), and use of rubber dam (34.7%) were considered as significant factors. In two other studies remaining enamel structure, number of pontic, cement type, RBB design and retainer surface treatment were regarded as very significant factors for RBB success

which are more or less similar to our study.[2,3] Some other factors considered vital for RBB success include proper case selection, alloy of framework, occlusal management and periodontal considerations.[22]

This study was conducted on the participants across the country, the results show that participants are poised in knowledge regarding RBBs, but they are reluctant to use this confidently because of lack of practical skills. Modest use of RBB in clinical practice is a question mark and a food for thought. Despite possessing adequate knowledge and showing inclination to use RBBs the utilisation of this beneficial treatment option is still infrequent. These results highlight the need for imparting clinical skills to the dental students at both undergraduate and postgraduate levels, required for provision of RBBs to their patients. Also, the students and general dentists will benefit from hands-on workshops and educational videos.

Recommendations: In future a qualitative study may be planned to find out in-depth reasons for lack of confidence and to identify various difficulties faced by the faculty in teaching RBBs for routine clinical use.

CONCLUSIONS

It is concluded that the participants of the study had adequate knowledge about RBBs, and they had inclination towards their use which is a positive finding in the current era of conservative dentistry. The occasional use of RBBs was reported to be related to lack of skills and technical support. There should be a focus towards improvements of skills amongst dentists and laboratory technicians for which the importance of continuing education programs for both dentists and technical staff cannot be over-emphasized.

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