

The removable acrylic partial denture in primary care: the experience and satisfaction of dental surgeons

A prótese parcial removível acrílica na atenção primária: experiência e satisfação dos cirurgiões dentistas

Rita de Cássia SILVA^{a*}, Raquel Conceição FERREIRA^a, Denise Vieira TRAVASSOS^a,
Andréa Maria Duarte VARGAS^a

^aFaculdade de Odontologia, UFMG – Universidade Federal de Minas Gerais, Belo Horizonte, MG, Brasil

Resumo

Introdução: As diretrizes da Política Nacional de Saúde Bucal orientaram para a inclusão de próteses elementares no rol de procedimentos da Atenção Primária em saúde bucal. **Objetivo:** Avaliou-se a experiência e satisfação dos cirurgiões-dentistas com relação à execução de Prótese Parcial Removível Acrílica no serviço público. **Metodologia:** A amostra foi composta de 159 cirurgiões-dentistas (cálculo amostral) da rede de atenção primária de Belo Horizonte, selecionados através de sorteio (amostra aleatória simples). Para a coleta de informações, construiu-se um questionário estruturado, com 72 questões inerentes à prática diária de sua execução. Para aplicação do questionário e facilitar a análise estatística dos resultados, utilizou-se a plataforma *SurveyMonkey*. **Resultado:** Para a maioria dos profissionais, a inclusão da prótese parcial removível acrílica como procedimento da Atenção Primária foi uma iniciativa positiva e a maioria teve boa experiência com as diversas fases de sua confecção. Os dentistas graduados em instituições privadas relataram ter mais insucessos do que os das instituições públicas. Verificou-se que quanto mais preparado se sentiu o dentista, menos dificuldade na confecção e menos relato de insucesso. Quanto mais satisfeito com a realização, maior ausência de insucesso. Com relação à indicação, a maioria o fez segundo o protocolo da instituição (somente para dentes anteriores) mas muitos revelaram a confecção incluindo também os pré-molares. **Conclusão:** A prótese parcial acrílica tem sido realidade no contexto social brasileiro mesmo antes da inclusão na Atenção Primária, o que dimensiona a sua relevância. No entanto, faz-se necessário ter sua confecção sistematizada por um protocolo próprio nos serviços públicos.

Descritores: Prótese parcial removível; cirurgiões-dentistas; satisfação no trabalho; protocolos clínicos.

Abstract

Introduction: The guidelines of the National Politics of Oral Health have led to the inclusion of elemental prostheses in the list of Primary Care procedures. **Objective:** This paper aimed to evaluate the performance and satisfaction of dental surgeons with the implementation of Acrylic Partial Dentures. **Methodology:** The sample was composed by 159 dental surgeons (sample calculation), in Belo Horizonte, MG, Brazil, selected via raffle (simple random sampling). A structured questionnaire was built with 72 questions on the daily practice of the performance of dental surgeons, using the *SurveyMonkey* platform. **Result:** The results showed that for most of dental surgeons, the inclusion on the list of primary care procedures was a positive initiative and they have enjoyed the experience of using Acrylic Partial Dentures. Dental surgeons who had graduated in private institutions reported to have had more failures than those who had graduated in public institutions. The better prepared dental surgeons reported less difficulties and failures, and the more satisfied professionals with the performance of Acrylic Partial Dentures related had also experienced fewer failures. Considering the indication, the majority of participants did it according to the protocol of the institution (only for anterior teeth) but many revealed the use of dentures also for premolars. **Conclusion:** Acrylic partial dentures have been a reality in the Brazilian social context even before their inclusion in the list of Primary Care procedures. Such inclusion indicates their relevance; however, it is necessary to have their confection systematized by a protocol in public services.

Descriptors: Partial dentures; dentists; job satisfaction; clinical protocols.

INTRODUCTION

The National Oral Health Policy guidelines led to the inclusion of prosthetic rehabilitation in primary health care services and recommend each place to consider the possibility of insertion of procedures related to the installation of elemental dental prostheses. These guidelines also define actions of rehabilitation, partial or total recovery of abilities that have been lost as a result of diseases and reintegration of individuals to their social environment and professional activities. They still affirm that the inclusion of complex procedures in primary health care contributes to increase the bond, the credibility and the recognition of the public dental service, so enhancing its impact and coverage¹.

SB-Brasil² data (Survey of the oral health conditions of the Brazilian population in the year 2010 conducted by the Ministry of Health) pointed out that 26.1% of the individuals aged 35-44 years in the Southeast region needed partial dentures in one jaw, 0.6% needed prostheses in both jaws, and when conjugated with the complete denture that percentage was 0.3%. Among individuals aged 65-74 years, 20.1% needed partial prosthesis in one jaw, 17.9% in both jaws and that percentage was 16.9% when conjugated with complete prostheses. The survey also reported that public health services were the most used in all Brazilian regions.

Regarding acrylic removable partial dentures, Xie et al.³ stated that they are temporary but indispensable for aesthetic relief and basic functionality before fixation of permanent dentures. They explain that although removable partial dentures are generally less appreciated in terms of comfort, masticatory function, occlusal stability and maintenance of oral hygiene, strategic modifications have been developed and implemented to improving them. The fact that they are non-invasive and cost-effective makes them feasible as a predictable treatment choice in clinical dentistry.

In 2006, the Oral Health Care Protocol of Belo Horizonte City Hall (BHCH)⁴ recommended offering "aesthetic recovery through direct restorations and/or partial or total removable acrylic dentures". However, the supply of acrylic dentures (conventional complete dentures and acrylic partial dentures with orthodontic arch wire) by the BHCH primary health care took place only in 2010, with gradual adherence of dental surgeons of the network.

In December 2015, the Oral Health Coordination (OHC)⁵ of the BHCH regulated the indication, characteristics and limitations of use of ARPD. They were then recommended in cases of aesthetic constraints, flaws caused by the absence of upper anterior teeth, as immediate prosthesis after anterior teeth exodontia; and lower anterior teeth failures with clear embarrassment caused to the patient. Dentures should not be indicated for functional restoration and improvement of masticatory ability.

From August 2010 to September 2016, 27,297 conventional complete removable dentures and 11,949 Acrylic Removable Partial Dentures were offered (SUSDATA)⁶.

The objective of the present study was to evaluate the experience and satisfaction of dental surgeons of the primary health care network of the city of Belo Horizonte as to Acrylic Removable Partial Dentures with orthodontic arch wire since their introduction in the list of basic care procedures.

Understanding the view of dental surgeons on ARPD on oral health care provided in the BHUs coordinated by the BHCH becomes relevant as a way to facilitate the systematization of its performance, seeking to give a scientific character, considering its demand. Knowing this process can contribute to a constructive rethinking of the offer of ARPD based on the difficulties reported. Such information transformed into data can contribute to the evaluation of service provision and subsidize discussions between the professionals and managers of the service.

METHODOLOGY

This is a cross-sectional study with dental surgeons on Acrylic Removable Partial Dentures (ARPD) based on the consolidated ARPD production of the BHUs of Belo Horizonte city within the period from August 2010 to September 2016. Among 359 dentists of the primary health care network, 159 were selected by lot to compose the sample (simple random sample). In order to know the number of dental surgeons in the study, a sample estimate was made by proportion estimation, with a sample error of 7%, prevalence of the condition of 50% (without previous studies on the view of surgeons on ARPD) and significance level of 95%. Then, another calculation was performed with the finite population, resulting in a total of 129 dentists. The sample was increased by 20% to prevent possible losses, leading to a final number of 155 dentists. The final sample was distributed proportionally to the number of dentists in each health district. At the end, 159 DSs answered the questionnaire.

A structured questionnaire with questions (72) on the daily practice of ARPD implementation was prepared and contemplated the satisfaction, preparation and difficulties faced with regard to indication, design, clinical phases of the implementation, possible difficulties encountered during the fixation and preservation of ARPD, as well as the view of dentists on their inclusion in the list of basic care procedures, based on the relevant literature. Data collected on the participating dental surgeons also included year of conclusion of undergraduate training, bond with the BHCH, time working with the institution, etc.

This instrument was first submitted to five experts for evaluation, who made suggestions on the inclusion of some questions, deletion of others and changes in the wording, which were mostly accepted. The questions presented five (five) response options in a *Likert*-type scale. In a second moment, this questionnaire was applied to a group of five BHCH primary health care professionals who had participated in the introduction of Acrylic Removable Partial Dentures in BHCH services but who were not part of the sample of this study in order to verify the suitability of the instrument. Their considerations were also accepted by the researchers. For application of the questionnaire and to facilitate the analysis of the results, the *SurveyMonkey* platform (*SurveyMonkeyInc.*, Palo Alto, California, US) was used.

Descriptive and statistical analyses of the results were carried out with the information obtained through the questionnaire. A factorial analysis was performed based on a polychoric correlation matrix of the questions addressing the satisfaction, difficulties and preparation of professionals. Then, a score was estimated from the solution of the factorial model and the scores were correlated by

means of the *Spearman* coefficient. Factors associated with failure in the preparation of dentures were verified, considering the questions on preparation, difficulties, satisfaction and other co-variables of the study. A logistic regression analysis was run for variables that had a significant effect on failures in the ARPD design process.

This study was submitted to the Research Ethics Committee of the Federal University of Minas Gerais and was approved under CAAE number: 57753816.6.0000.5149.

RESULT

Results regarding the sociodemographic and professional characteristics of the dental surgeons are shown in Table 1, below.

Table 1. Sociodemographic and professional characteristics of dental surgeons, BHCH, Belo Horizonte

Characteristics	N	Percentage %
Age group – 154		
20-39 years	60	38.96
40-59 years	81	52.59
60-70 years	13	8.44
Gender – 159		
Male	40	25.15
Female	119	74.84
Years since graduation – 159		
Up to one year	1	0.62
2-5 years	10	6.28
6 to 10 years	25	15.70
11 to 15 years	26	16.35
More than 15 years	97	61.00
Undergraduate training – 158		
Private institution	59	37.10
Public institution	99	62.26
Employment bond through public contest – 159		
Yes	143	89.93
No	16	10.06
Working hours PHC- 158		
20h	20	12.60
40h	137	86.71
Others	1	0.63
ESB modality- 154		
1	55	35.71
2	78	50.64
Support	21	13.60

Source: survey data.

Regarding the group of patients with missing teeth to be restored, most professionals (81%) answered that they opted for ARPD to restore the upper anterior teeth only, therefore within the indications of the BHCH. However, of this percentage, 35% chose the “almost always” option; 33%, “sometimes”; and only 13% “always”, options computed as “positive” on this question. The percentage of those who “rarely” and “never” opted for ARPD, in this condition, represented 18% of the participants, options computed as “negative” on this question. Regarding the unerupted upper premolars, 30.77% participants answered that they “sometimes” used ARPD for these cases, therefore out of the scope of the indications of the BHCH.

The view of dental surgeons on satisfaction, difficulties and preparation in the various phases of ARPD preparation was also evaluated considering positive (almost always, sometimes, always) and negative (rarely and never) results. The results are presented in Table 2.

Scores for satisfaction, preparation and difficulties were generated in the factorial analysis showing also high factor loads in all factors of the analysis of each of them separately. Table 3 below shows the correlation between these scores.

Correlations showed that being more prepared to perform the implementation of ARPD implied the presence of fewer difficulties in its several phases. Higher satisfaction in the various phases of ARPD implementation implied better preparation to execute them. The causes of the main failures were: problems with the laboratory, problems related to the professional himself, aesthetic problems (patient), maladaptation of the acrylic base, either with the design, the orthodontic arch wire, and tilting, in this order.

Satisfaction, preparation and difficulties scores were correlated with the report of failures (yes, no) and showed significant correlations with preparation scores. The lower the preparation score (more prepared), the more frequent was the absence of failures.

When satisfaction scores were correlated with those of failures, it was found that the more satisfied the professionals (lower score), the more frequent was the absence of failures. As for difficulties, higher the difficulty (lower score) was related to less failures.

Regarding the several variables of the study and the report of failures, the bivariate analysis showed that dental surgeons who graduated in private institutions had experienced more failures ($p < 0.001$); the participation of patients in dental tests also implied more failures ($p = 0.042$), as well as did the negative evaluation of DSs on the inclusion of ARPD in the list of Basic Care procedures ($p = 0.003$). Those who had negative experiences (disliked) with the various phases of implementation of ARPD also had more failures (0.000).

Complementing the statistical analysis, we performed a logistic regression with the most significant variables; the results are presented in Table 4, below.

The results show that DSs who negatively evaluated the inclusion of ARPD in the list of Primary Care procedures was 1.71 times more likely to experience failures the implementation of ARPD.

Table 2. View of BHCH dentists on the preparation, difficulties and satisfaction at each stage of the preparation of ARPD

Steps	Preparation		Difficulty		Satisfaction	
	N	%	n	%	N	%
Indication						
Positive	143	92.25	135	87.09	77	49.35
Negative	12	7.74	20	12.90	79	50.64
Planning						
Positive	140	89.74	131	84.51	85	54.83
Negative	16	10.25	24	15.48	70	45.16
Molding						
Positive	141	90.38	138	88.46	117	75.00
Negative	15	09.61	18	11.53	39	25.00
Adjustment						
Positive	134	86.45	139	89.67	91	58.33
Negative	21	13.54	16	10.32	65	41.66
Installation						
Positive	137	88.96	112	72.25	93	59.61
Negative	17	11.03	43	27.74	63	40.38
Prosevation						
Positive	135	87.09	131	84.51	85	54.48
Negative	20	12.90	24	15.48	71	45.51

Source: survey data.

Table 3. Correlation between preparation, difficulty and satisfaction scores

	Difficulty	Preparation	Satisfaction
Difficulty	1.00		
Preparation	0.77	1.00	
Satisfaction	0.68	0.65	1.00

Table 4. Logistic Regression with variables which had significant influence on the failure of preparation of ARPD

Variables	OR	P > z	95% CI
Evaluation of the inclusion of ARPD in PHC in the view of the DS	1.71	0.050	1.00-2.94
Type of institution	4.51	0.001	1.86-10.91
Patient Participation	0.19	0.009	0.55-0.66
Experience with execution	3.85	0.004	1.54-9.57

DSs that had graduated in private institutions were 4.51 times more likely to experience failures compared to those who had graduated in public institutions. The participation of patients in the dental tests implied a 0.19-fold higher risk of failure, and the negative experience with the prosthesis, a 3.85-fold higher risk of failure.

DISCUSSION

This study showed that for most dental surgeons, the inclusion of ARPD in the list of Primary Care procedures was a positive initiative and they enjoyed the experience with the different phases of ARPD preparation. The study also revealed that DSs graduated from private institutions reported having experienced more failures than graduates from public institutions. It was also verified that the more prepared were the DSs, the less frequently they reported failures, and the more satisfied they were with ARPD, the more frequent was the absence of failures. Regarding the indication of ARPD, most professionals acted in accordance to the protocol of the institution (anterior teeth only), but many reported the use also in the case of premolar teeth.

In the context of the Brazilian reality, the use of ARPD seems to be important to solve aesthetic problems of the population. In Belo Horizonte, what would often be considered a temporary or provisional prosthesis by various authors, has in fact become a definitive treatment option, since the BHCH has had difficulty to provide conventional RPD (cobalt-chrome).

The world literature also has references on the use of ARPD as a treatment option. For example, Radhi et al.⁷ reported that from 131 prescriptions of dentists sent to the laboratories in the Kingdom of Bahrain, 89% are requests of acrylic prostheses. Allen et al.⁸ found similar results in a survey in UK, where 43% were cases of acrylic

prosthesis; Pun et al.⁹ reported that in the USA, the percentage of acrylic prostheses used in the study was 33.2% and that one in three partial dentures was acrylic or flexible prostheses and one in five dentures had no dental supports.

Wilson¹⁰ stated that ARPD could be considered permanent prostheses and a low-cost treatment option, provided that criteria such as selection and level of education of patients, and adherence to principles of denture designing were observed. These criteria would be more important than the material used in the dentures.

The principles for preparation of ARPD are ideally the same as those for permanent dentures (cobalt-chrome). In the case of the BHCH, ARPD are made from an alginate molding. All laboratory phases are executed with the obtained model, i.e. the working model. The adjustment of orientation planes and dental tests are performed by the DS.

Regarding the denture design, 68% of professionals considered this aspect as a cause of failure. This result found support in the literature, in the studies that investigated communication between dentists and laboratories, and that reported the production of unsatisfactory acrylic prostheses related to the inadequacy of written instructions, mainly in the case of acrylic prostheses, largely delegated to technicians and with a minimal participation of the dentists in the supervision of the design^{7,9}.

In another study⁸, most dentists reported that the success of the cobalt-chrome prostheses would be positively influenced by the participation of dentists in the design, but only half of them reported having designed the prostheses they used. Regarding the quality of the models and the requisitions sent to the laboratories, in the case of cobalt-chrome RPD, the authors^{11,12} concluded that both are precarious and that the planning of the cases, for the most part, is delegated to the laboratory without basic dental preparations for the prostheses.

A study¹³ on factors related to the quality of life of removable partial denture users reported that the most frequent problems arising from the use of such prostheses should be considered by clinicians and explained to the patients when planning and executing RPD treatment.

The majority of DSs considered positive the inclusion of ARPD in the list of basic care procedures. This shows that DSs have incorporated the guidelines of the National Oral Health Policy that guide the pursuit for qualification of primary care, with the inclusion of elemental prostheses. The idea was to advance in overcoming the situation at the time, when its insertion in specialized services prevented access to the prosthesis for most of the population.

The results of the present study showed that BHCH DSs were prepared and satisfied with the execution of most of the ARPD preparation phases, but also reported considerable difficulty percentages in all of them. This divergence may be related to courses on removable partial dentures in universities, as also reported by Lynch, Allen¹⁴ in a study conducted in the United Kingdom on the factors that would model the supply of removable partial dentures, where the results showed a divergence also between the practice and knowledge acquired in universities.

It is necessary to discuss the high percentage of difficulty in the phase of prosthesis, most probably due to lack of prioritization of the clinical stage in care schedules or lack of prevention habit. Regarding the importance of this phase, several authors^{15,16} have emphasized the need for regular visits to the dentist after insertion of the prostheses, the patient's individual commitment to self-care and the need to audit professionals about the knowledge related to this phase. Sekele et al.¹⁷, in a study conducted in the Democratic Republic of Congo, observed greater plaque and gingival index in ARPD users when compared to non-users. They stated that there would be a need to improve oral hygiene and organize regular visits to dentists, which in their view would become a problem for public health services.

When comparing the expectations of dentists, prosthesis technicians and patients before and after treatment with new removable complete dentures, Marachlioglou et al.¹⁸ concluded that patients showed higher expectation with prosthesis than dentists and technicians. The dentist believed that prostheses would bring fewer benefits than did the patients. These results may indicate a negative predisposition of DSs towards this type of prosthesis and the fact that 62% of the DSs supported the introduction of ARPD in the list of procedures should probably be because they do not have other treatment options available to users.

For Garbin et al.¹⁹, the best performance of the dentists graduated from public institutions when compared to peers from the private network may be related to academic autonomy and flexibility regarding the professional training in the health area. These authors explain that these aspects were advocated by Law of Directives and Bases, which established curricular guidelines in Brazil, and they also explain that autonomy should seek to train professionals committed to relevance, quality, cost-effectiveness and equity in health care. Thus, there was a possibility of choosing courses that taught more complex procedures, which could be more valued by professionals and by patients themselves, and also as well as better remunerated. The same reasoning may be possible if we consider a curriculum that privileged training for a liberal market. This would generate a greater tendency to perform more complex procedures, directed to the more elitist part of the population, disregarding RPD and ARPD, because of their lower cost, usually directed to the populations of lower purchasing power, generating smaller gains to clinics.

Goetz et al.²⁰ studied the impact of extrinsic (hygiene, safety at work, salary and working conditions) and intrinsic-motivational factors (acknowledgement and responsibility) in the satisfaction of professionals with work, and they concluded that both groups of factors are important, but the opportunity to use skills had the most positive impact on personal satisfaction. This finding is consistent with the results of the present study, which concluded that the higher the satisfaction of DSs with ARPD production was related to lower frequency of failures in the various phases of execution. In fact, when there is motivation to do a job, the chance for success is high.

Regarding the result that related the relation between preparation of DSs for the execution of the various phases and the lower frequency of failures and less difficulties, the study by Kimoto et al.²¹ showed

that clinical experience influences towards better results of treatment with complete dentures, shorter time spent with patients and fewer adjustments. In the case of the present study, the majority of the DSs had more than 15 years of experience after completing college training, and therefore had already good clinical experience, which probably made them report to be better prepared and satisfied with the work done.

Kimoto et al.²¹ verified the relationship between prosthetic experience of dental surgeons and the satisfaction of users with the prostheses and showed that the clinical experience, as to the prosthesis, affects the satisfaction of users who receive them, pointing out that the users also have this perception on the valuation of the experience of professionals. The literature also shows greater professional satisfaction linked to longer working time, that is, longer time elapsed after graduation, mainly due to the issues of better performance, greater technical ability, greater professional credentials and better relationship with patients¹⁰.

In a critical review of “dogmas” or old truths in dentistry based on systematic reviews and randomized clinical trials, Carlsson²² concluded that the fulfillment of technical and anatomical requirements in the preparation of complete dentures is less important than the psychological factors of patients and the personality of dentists to achieve user satisfaction.

The variation in the indication of ARPD according to the groups of teeth to be replaced leads us to reflect on the necessity

of a protocol built with the participation of DSs and users, an idea shared with Andrade et al.²³. These authors validated a clinical and regulatory protocol for oral health by the “Delphi technique”. They argue that the protocols must count on the valorization and adhesion of public network professionals under the risk of being denied by all. They continue to state that co-management in health must be based on the perception of professionals who deal daily with adverse situations and who are responsible for making a global diagnosis and identifying priority treatment needs, which encourages autonomy and co-responsibility of all, reversing the fragmented form in which dental practice has been treated within the SUS.

This study may have as a limitation the memory bias of dentists, because the production of ARPD by DSs of the BHUs since the beginning of the offer to the users until August 2010 was evaluated. Another limitation was the fact that it was not possible to investigate the satisfaction users, important actors in the process, with the ARPD.

Although the ARPD are relatively easy to prepare and apply, their production basically follows the same principles of the other prostheses and require that steps be properly taken for a good result. In this sense, ARPD need to be evaluated and monitored by the services as well as the DSs qualified for their preparation. Partial acrylic dentures have been a reality in the Brazilian social context even before their insertion in the list of Primary Care procedures. Such inclusion indicates their relevance, but it is necessary to have their confection systematized by a protocol in the public services.

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CONFLICTS OF INTERESTS

The authors declare no conflicts of interest.

*CORRESPONDING AUTHOR

Rita de Cássia Silva, Av. Dom Joaquim Silvério, 921, ap. 203, Coração Eucarístico, 30535-620 Belo Horizonte - MG, Brasil, e-mail: ritamaedomarcinho@gmail.com

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