



RESEARCH ARTICLE

KNOWLEDGE AWARENESS PRACTICE AMONG DENTAL PRACTITIONERS REGARDING
THE USE OF BURS IN TOOTH PREPARATION

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ABSTRACT

Objective: This study was conducted with the aim of demonstrating the level of knowledge and practice amongst general dental practitioners in Chennai city, India in 2016-17, in terms of usage of dental burs.

Materials and Methods: In this cross sectional study, the general dental doctors in Chennai provided information on their approach in dealing with the dental burs, via a pretested self administered questionnaire. The first part includes the knowledge and the last part involves dentist's practice in terms of usage of burs. Data from the questionnaires were analyzed using SPSS 16 software.

Results: A total 102 practitioners answered the questions, a response rate of 100%. Among the sample, 47% preferred to use the diamond burs and 33% preferred to use tungsten burs. About 48% would use a bur only once and 39% would use twice and none would never discard a bur. Doctors knew that the burs efficiency decrease with usage.

Conclusion: This study revealed a low level of knowledge and practice regarding the uses of burs in tooth preparation among dental practitioners.

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INTRODUCTION

In restorative dentistry, the removal and shaping of tooth structure is very important aspect. Initially this was a difficult process which could only be accomplished entirely by the use of hand instruments (Theodore *et al.*). In order to maximize aesthetics, improve fracture resistance, optimize laboratory artistry and maintain soft tissue health meticulous tooth preparation is required. Most of the dental restorations are either extra-coronal restorations or intra-coronal restorations or a combination of the above. The term bur is applied to all rotary cutting instruments that have bladed cutting heads which remove the tooth structure either by cutting or by abrading. In restorative dentistry, there exists a range of cutting instruments namely from steel burs to carbide burs to diamond abrasives. Bur selection is probably based on several factors: tradition, shape, clinical procedure being done, substrate being cut, their method of sterilization and disposal (Sharon *et al.*, 1999). The rationale for bur selection and its application is not addressed in the literature or in standard operative and prosthodontics texts. Moreover, this selection is complicated by the availability of these dental drill in different sizes and coarseness.

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Bur selection and use are complicated by the fact that cutting efficiency tends to decrease as bur wears out and as debris accumulates on the bur (Sharon *et al.*, 1997). We undertook the present survey to understand the use, misuse and the applicability of the dental burs in daily practice. A questionnaire was constructed and sent to all private practitioners to address bur selection, usage, sterilization and disposal for tooth preparation in restorative dentistry.

Aim

The purpose of this study was to find and evaluate the knowledge and awareness about the dental burs usage and procedures and method of disposal among the dental doctors in restorative dentistry at Chennai.

MATERIALS AND METHODS

This cross-sectional analytic-descriptive study was conducted from 2016-2017. The target population was the general practicing dentists of Chennai. Data was gathered via a structured self-administered questionnaire which consisted of to a total of 10 questions. It mainly focussed on their knowledge of the usage of burs and their practice of the dentistry regarding burs. The questionnaires were passed to the general dentists by a dentistry student; the respondents were

assured of the confidentiality of their answers. In the first part of the questionnaire (knowledge). To enable comparison with other studies, the grades were converted to percentages. In the last part (practice), the score for each question was recorded. Statistical analysis was performed using the 16th version of the SPSS software. The results were summarised in frequencies and percentages, and are presented in next section. Questions were framed for knowing how many times the burs were used, how was the cutting efficiency. In the sterilization category questions were framed on the various sterilization protocols available for dental burs and the operators preferred method of sterilization. Questions were also framed about truing and dressing of the dental burs. A total 102 practitioners answered the questions, a response rate of 100%, since we had asked them not to leave any questions unanswered and the unanswered questionnaires were rejected to be considered in the data analysis. The questionnaires were sent to the practitioners and were asked to choose the answer one among them. The data was collected and analysed statistically. The most common answer was represented in terms of percentage.

RESULTS

102 questionnaires were distributed to general practicing dentists; the overall response of the participants was 100%, consisting of 62 (60.78%) male and 40 (39.22%) female respondents. The minimum and maximum ages were 26 and 61, with a mean of 39.39 ± 8.13 . A total 102 practitioners answered the questions, a response rate of 100%, since we had asked them not to leave any questions unanswered and the unanswered questionnaires were rejected to be considered in the data analysis. The data was represented graphically and the frequency was represented in terms of percentage. The data is discussed as follows [Fig-1-3]:

DISCUSSION

In general clinical practice, diamond burs are used under strenuous and varying conditions. It should be kept in mind that, with exacting the technical requirements involved in the use of high circumferential speeds, the methods and techniques of removal should be taken into account (Miroslav Janota, 1973). These, to a great extent, depend on the individual approach and skill of each dentist. The literature provides few guidelines on bur selection, and standard texts differ in their recommendations on bur selection for clinical procedures. This study was conducted to evaluate the operators knowledge on bur selection for restorative procedures which would enable educators to evaluate their recommendations relative to their peers and facilitate evidence-based clinical teaching and research. A database on bur usage is necessary if laboratory-based cutting studies are to provide useful information for the dental practitioner. And the last purpose was the mode of infection control and disposal awareness among the practitioners. Bur selection and use are complicated by the fact that cutting efficiency tends to decrease as bur wears out and as debris accumulates on the bur. Studies have shown that CE depends on both the diamond bur grit size and duration of the cutting procedure. Over short cutting periods, medium, coarse and super coarse have comparable cutting rates. More prolonged the cutting, the efficiency decreases (Sharon, 2000). In our survey most of the practitioners showed a positive affinity towards the diamond burs followed by the tungsten carbide burs for tooth reduction. During tooth preparation energy that was not used in cutting process is mostly transformed in to heat. The amount of heat transmitted to the tooth typically depends on the type of the bur, pressure applied, cutting time and rate, cooling techniques and speed and torque of the rotary instrument (Rafael Grajower *et al.*, 1979).

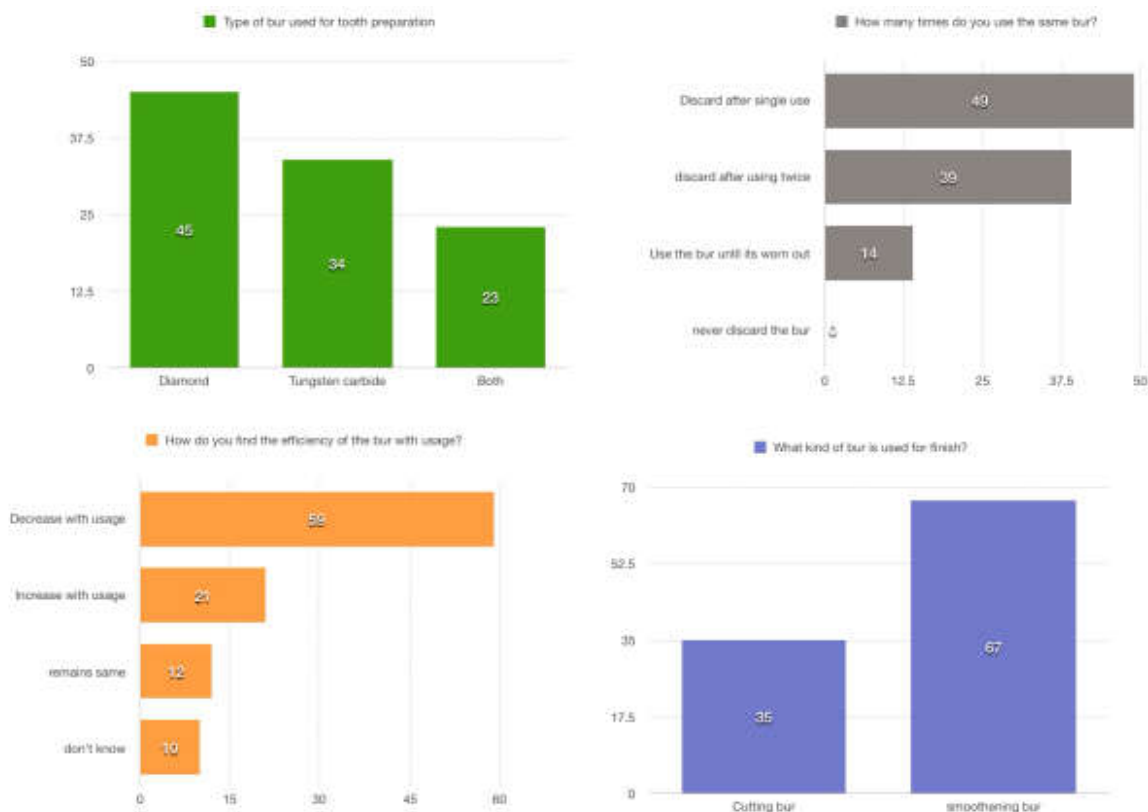


Figure 1.

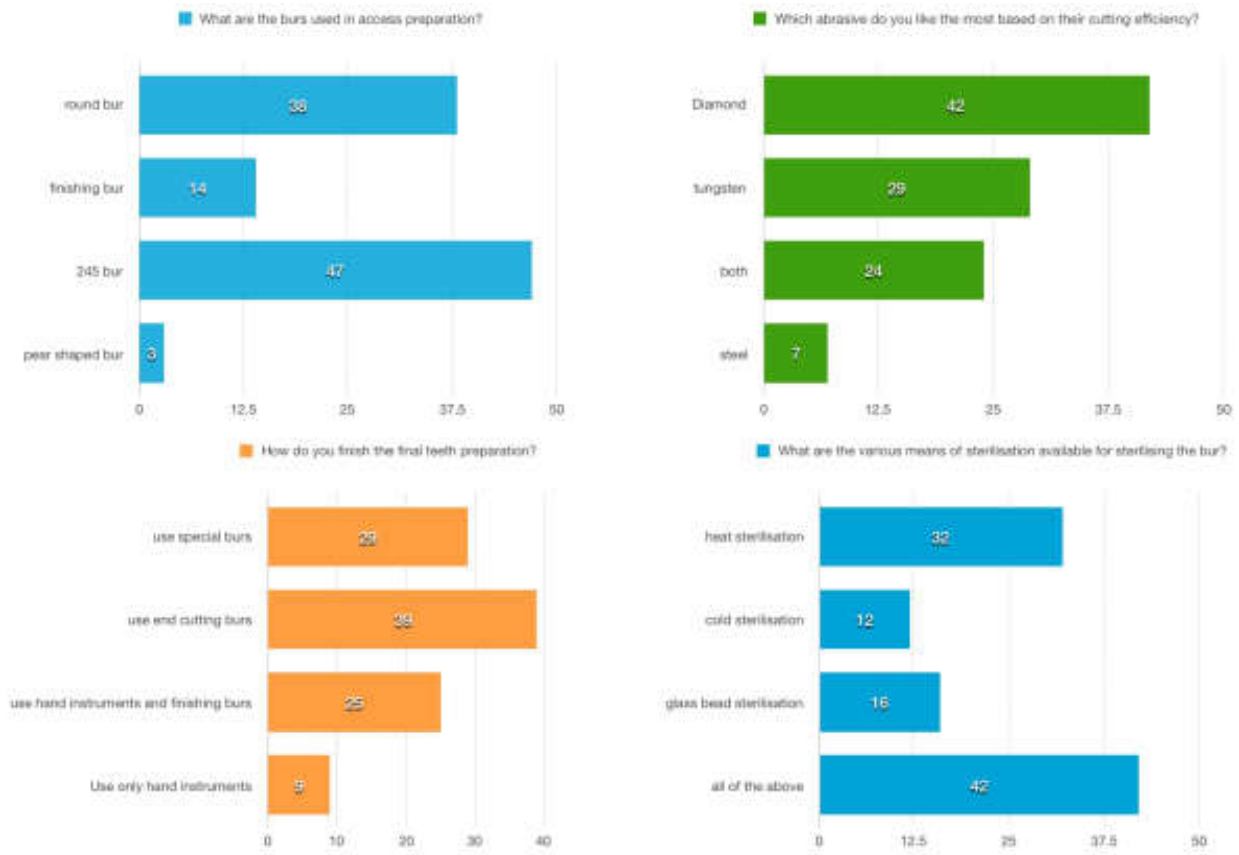


Figure 2.

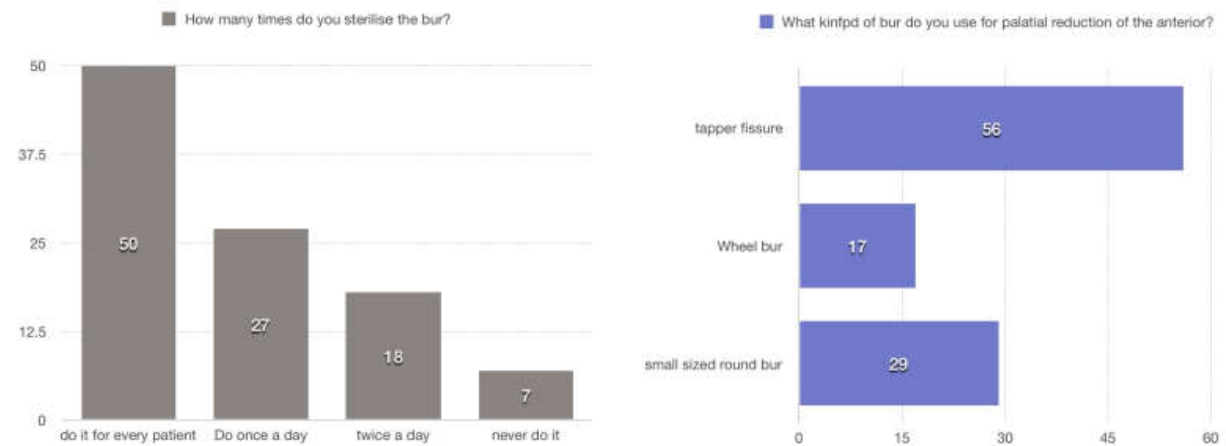


Figure 3.

However, studies have shown that there are various ways of improving the cutting efficiency of the diamond burs irrespective of their grit sizes, these ranging from using chemico-mechanical sprays to the coolant, using more amount of coolant directed towards the bur either by single port or by multiple ports (Anthony *et al.*, 2003; Sharon *et al.* 2002 Sharon *et al.*, 2000). During grinding debris accumulates on the surface of the bur which would decrease the cutting efficiency, because this partially blocks the penetration of the abrasive particles into the substrate. Clogging is enhanced by increased particle density and the presence of “undercuts” on the protruding part of the particles. Coolant helps in the prevention of accumulation of debris and improves the cutting efficiency. In our study most of the practitioners showed a positive affinity towards the diamond abrasives and believed that coarseness is directly related to the cutting efficiency.

Product manufacturers have introduced single use diamond burs as a partial solution to the dental profession’s concerns regarding infection control. Although disposable diamond burs have been marketed for years, limited information is available regarding cutting rates and durability (Elizabeth *et al.* 2000). Hence, if a diamond bur is not thoroughly cleaned of debris, or if it has been used for procedures with several patients and sterilized several times, it may not be an effective cutting instrument. Studies have shown that with longer duration cutting efficiency decreases because of clogging of the bur. In our study, it was found that most practitioners disposed their worn out burst into dustbins but actually these burs should have been sent back to the factory for recycling. So, focus should be laid in educating the dentists to help in recycling old worn out burs. Diseases may be transmitted by indirect contact when dental instruments contaminated by one patient are

reused for another patient without adequate disinfection or sterilization between uses. The process of sterilization is designed to render instruments free of all microbial life, including bacterial spores, which can be very difficult to kill. Resterilization is simply the repeated application of a sterilization procedure to an instrument or device to remove contamination, allowing for its use in treating multiple patients. Dental burs come in a variety of shapes and sizes, all with very complex and detailed surface features. Ultrasonic cleaning can also be an effective and time-saving method of cleaning instruments, although it is not capable of removing all contamination (Archie Morrison and Susan Conrod, 2009). This technique makes the debris to be removed and prevent clogging. Cold sterilization is an effective way of rendering the burs free of bacterial contamination. However, it will be wise to use single patient use bur as they not only provide an effective way of sterilization but also the cutting efficiency is good.

Conclusion

From the survey we came to know the operators attitude towards one group of burs in terms of cutting efficiency. However, the need of the hour is to formulate the guidelines for bur selection, use and their disposal as it not only will standardize the choice, but misuse and applicability will be reduced. Single patient burs should be the choice of burs as they have effective cutting efficiency and strict sterilization protocols can be followed.

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