



Attitude of parents and dentists about the restorative materials used in Pediatric Dentistry

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General Note



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ABSTRACT

Background: This study aimed to assess the attitude of parents and dentists about the restorative materials used in pediatric dentistry. **Methods:** This study was performed on 157 parents of children referred to the dentist and 157 dentists in Iran. A questionnaire was designed containing 8 questions for parents and a questionnaire containing 24 questions for dentists. At the beginning of the questionnaires, questions were about demographic information, and in the next questions, parents' and dentist's

attitudes about the restorative materials were evaluated. *Results:* In comparison of restorative materials, composite and amalgam had the highest acceptability among parents, and the most concern was related to the durability of the composite and beauty of the amalgam. Acceptability of stainless crown was less than that of amalgam and composites, and the esthetic of these crowns was the most concerns of parents. Veneered crowns were the least acceptable for parents, and parents' greatest concern was for its cost and durability. The selected material to restoration class II proximal cavities in dentists was amalgam. Only 3% of dentists never used amalgam to restoration primary molars. In dentists' opinion, the greatest concern for parents is durability and cost of the restorative materials. The priorities for choosing the restoration materials for primary molars by dentists were 74% isolation ability, 24% involvement of more than two surfaces of teeth, and 17% child cooperation and cavity size, respectively. *Conclusion:* While composite and amalgam are the most acceptable restoration materials among parents, dentists mostly used amalgam to restore primary molars. The acceptability of restorative materials and concerns about the use of restorative materials were different between parents and dentists. Most dentists did not comply with parents' wishes in the choice of restorative materials.

Keywords: Deciduous teeth, pediatric dentistry, restorative material, esthetic

1. INTRODUCTION

Today, various restorative materials are available for dentists. Their choices include glass ionomer, composite, compomer, amalgam and stainless steel crown (Krämer et al., 2007). Clinical judgment for choosing the material is complex and depends on many factors such as the patient, dentist and characteristics of the restorative materials (Berg, 1998). Special clinical conditions in children affect the choice of appropriate restorative material than adults (Pinkham et al., 2013). The success rate of these materials was different in studies, in one study SSC presented the highest (96.1%) and MRGIC presented the lowest (57.4%) (Gao, 2018). And in another study there was no advantage among restorative treatments using compomer, resin-modified glass ionomer cement, amalgam and composite resin (Pires et al., 2018). But in Soncini study composite restorations required more restorations than amalgam restorations (Soncini et al., 2007).

There is evidence supporting the use composite resins in primary teeth for Class I restorations. But for Class II lesions in primary teeth, there is one randomized controlled trial showing success of composite resin restorations over a two year period. In cases with difficult isolation or uncooperative child, composites are not the best choice of materials. There is an evidence of greater longevity of preformed metal crown restorations compared to amalgam restorations for the restoration of primary molars, especially in large restorations (Dhar et al., 2015).

Lee in (2004) showed that 68% of dentists stated that amalgam was a safe, reliable, and economical. The most important reason for using composite was patient demand (86%) and beauty (78%). Consequently, although amalgam was the most commonly used material, other restorative materials are increasingly being used by dentists (Lee et al., 2004). When choosing the appropriate restorative material for children, some factors such as child cooperation, age, parents' demands, treatment costs and toxicity issues are important. Patients are legally entitled to be aware of the findings of pre-treatment examinations, treatment methods, costs, risks and possible complications of treatment, and other possible treatment options (Guelmann et al., 2001). Today, parents are more involved with decision-making in treatment than the past (King, 2005). Studies have found that beauty, cost, toxicity and durability are the most common issues parents consider in choosing appropriate restorative materials for their child (Grembowski et al., 1988; Woo et al., 2005). Zimmerman showed that Parents are very worried about the beauty and cost of crowns in primary molars and there is disagreement between dentists and parents in the case of choosing dental materials (Zimmerman et al., 2009). Dental treatment of young children needs parent's agreement to become possible. There are some questions in relationship between dentist and parents in the treatment of young children:

1. How much parents' requests affect the treatment of young children?
2. Which materials do dentists prefer for restoring primary molars?
3. How much the dentists agree with parents wishes for choosing the treatment of young children?

Previous studies about restorative materials in primary teeth are not very helpful in answering these questions. Social, economical and cultural factors are important when considering parental preferences for care. Instructions provided by dentists can inform parents about treatment choices and in many cases parents are happy to leave the decision on treatment to the dentist (Tickle et al., 2003). The attitude of parents towards restorative material in primary molars can significantly affect the clinician's choice of technique. So, this is important to know about dentists and parents opinions and how they deal the dentists in the cases of

disagreement with parents. This study aimed to assess the attitude of parents and dentists about the restorative materials in primary molars.

2. METHODS

This is a descriptive epidemiologic study. The parents of children referring to the dentist and also the dentists in the Ahwaz city in the year 2017 were the research population. In this study, simple random sampling method was used and the sample size required for this study included 157 parents and 157 dentists in Ahwaz.

In this study, two questionnaires were used for data collection. Parent questionnaire consisted of 2 parts. In the first part, the demographic characteristics of samples including age, sex, level of education, income level, and number of children and source of dental information were collected. In the second part, parents' opinions were asked about different restorative materials (composite, amalgam, Stainless steel crown, veneered SSC) by showing their photographs. On a five-point Likert scale from 'fully agree' to 'fully disagree', assessed the parent's attitude towards restorative materials. Their responses were scored from 1 to 5; with the higher scores indicating higher agreement of them.

Another questionnaire was prepared for evaluating dentist's opinion about the restorative materials used in pediatric dentistry. The questionnaire consisted of 24 questions, its first part consisting of 5 questions about the personal information of dentists such as age, sex, and work experience, number of patients per day and admission of children. The second part contained 19 questions about the use of restorative materials. The questions were asked in a multiple-choice format. This questionnaire was similar to the Zimmerman questionnaire and has been validated (Zimmerman et al., 2009).

Collected data were analyzed by T-test, Chi-square and one-way ANOVA using SPSS software. Descriptive statistics were also used to analyze the data.

3. RESULTS

Parent's agreement with restorative materials in primary molars was Composite and amalgam, SSC and veneered SSC, respectively (Figure1-4). Parents more concerns about composite was durability and cost; for amalgam restorations beauty and toxicity, for SSC, beauty and cost and for veneered SSC cost and durability were the most concerns.

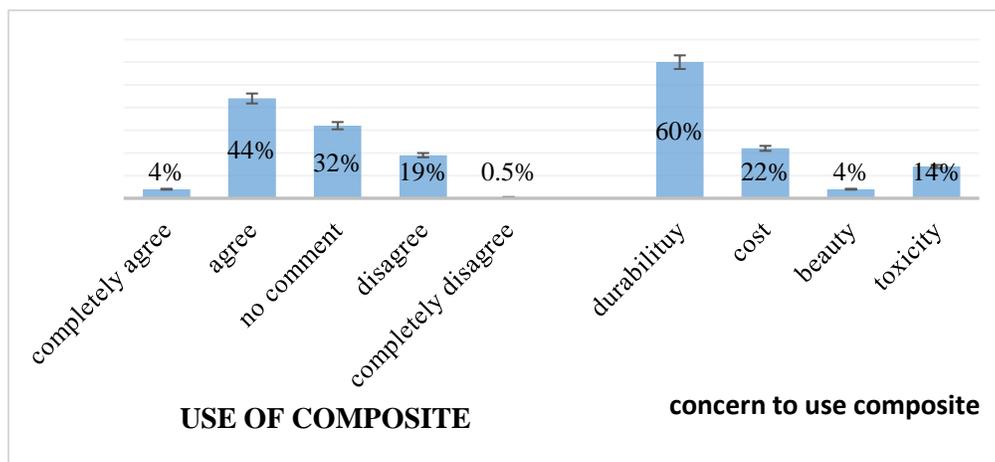


Figure 1 Parent's attitude toward composite use

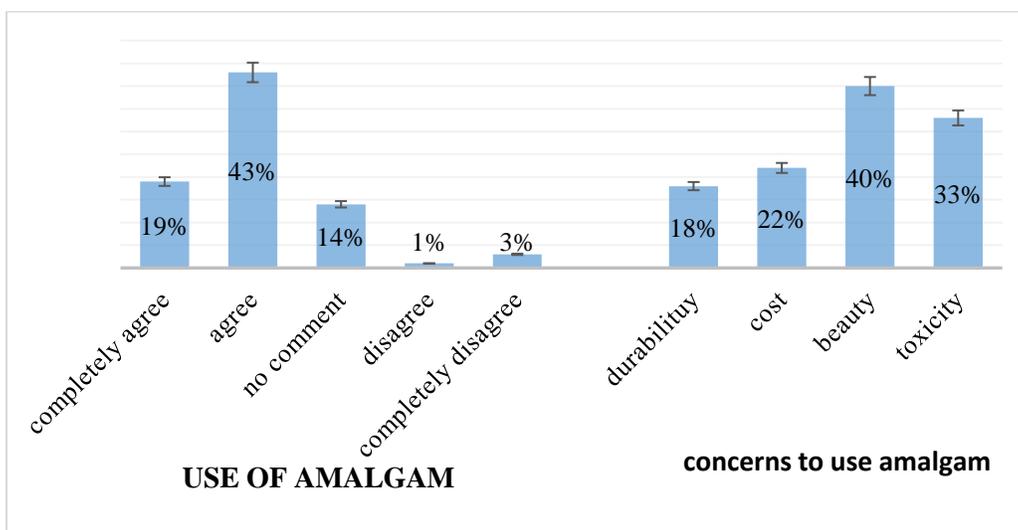


Figure 2 Parents' attitude to the use of amalgam

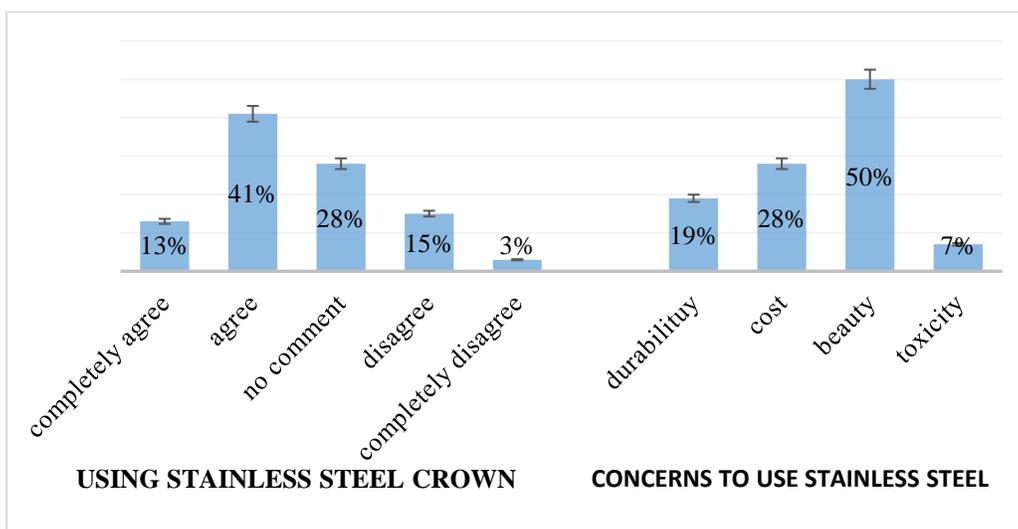


Figure 3 Parents' attitude to use stainless steel

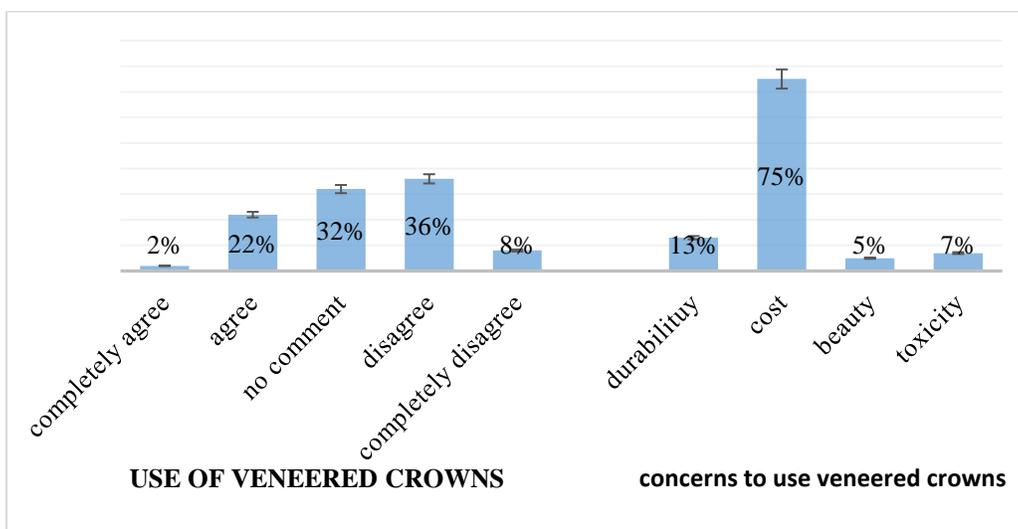


Figure 4 Parents' attitude to use veneered crowns

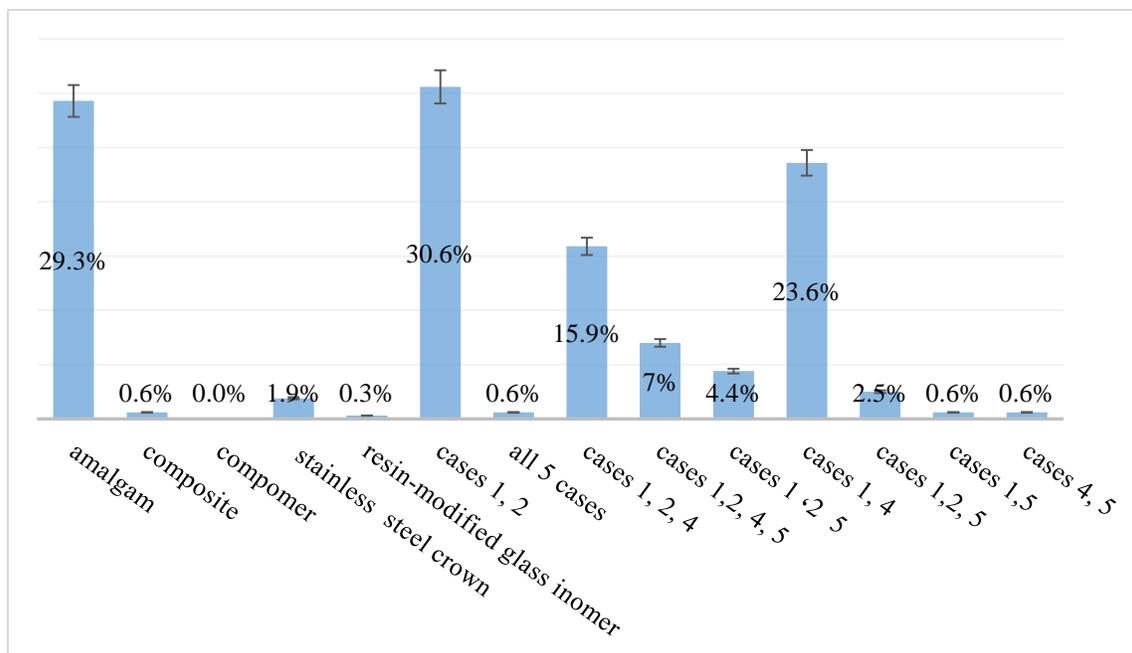


Figure 5 Frequency distribution of materials used for restoration of primary teeth molars

Frequency of dental materials used by dentists is shown in figure 5. In our study, 82% of dentists preferred amalgam for the proximal class II cavity restoration, 5% composite, 10% stainless steel crown and 3% resin modified glass ionomer (Figure 6).

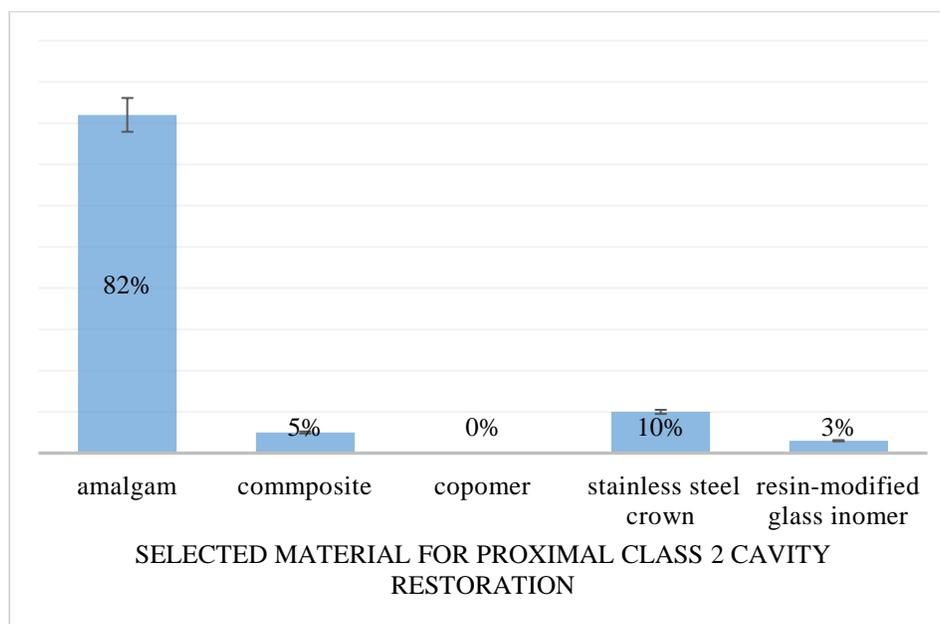


Figure 6 Distribution of the selected material percentage for proximal class II cavity restoration

76% of dentists usually, 21% sometimes and 3% never used amalgam. 10% usually, 66% sometimes and 24% never used composites. 24% usually, 51% sometimes and 25% never used stainless steel crowns. Dentist's response about their advertisement for restorative materials showed that 3% of dentists used non-metallic or mercury-free restoration in their ads if they do not use amalgam. 89% reported No and 8% responded that it is not practica to eliminate amalgam. As the results showed, 9% of the parents had a primary role, 56% had a secondary role and 35% had no role at all in the dentists' decision to choose between composite and amalgam in the ideal class II cavities of the primary molars. From the dentist's point of view, 29% of parents were worried about the cost of dental materials, 23% beauty, 12% toxicity, and 36% were worried about the durability of the restorative materials. For

parental concerns about mercury in the use of amalgam, according to dentists opinion, 5% of parents often worried about mercury used in amalgam, 60% sometimes and 35% never worried about mercury used in amalgam from the view point of dentists.

Parents' concerns about the toxicity of tooth-colored materials showed that 2% of parents often worried about the toxicity of tooth-colored materials, 18% sometimes and 79% never worried about the toxicity of the tooth-colored materials from the view point of dentists. In our results, when parents worry about the mercury used in amalgam, 7% of dentists do not answer, 2.5% agree, 33% talk scientifically, 4.5 changes the treatment plan with tooth-colored materials and 53% reassure parents about the scarcity of mercury released. When parents insist on using unsuitable restorative materials, 47% of the dentists recommend the material again, 25% suggest referring to another dentist, 9% do the parents' wish, and 20% receive a consent form upon their request. From dentists point of view, 36% of parents were worried about beauty, 51% worried about cost, 3% worried about pain in the child and 10% were concerned about the placement of metal in the child's teeth. Caries risk, isolation ability and multi surface restorations were the most important factors for choosing a restorative material in primary molars by dentist (Figure 7).

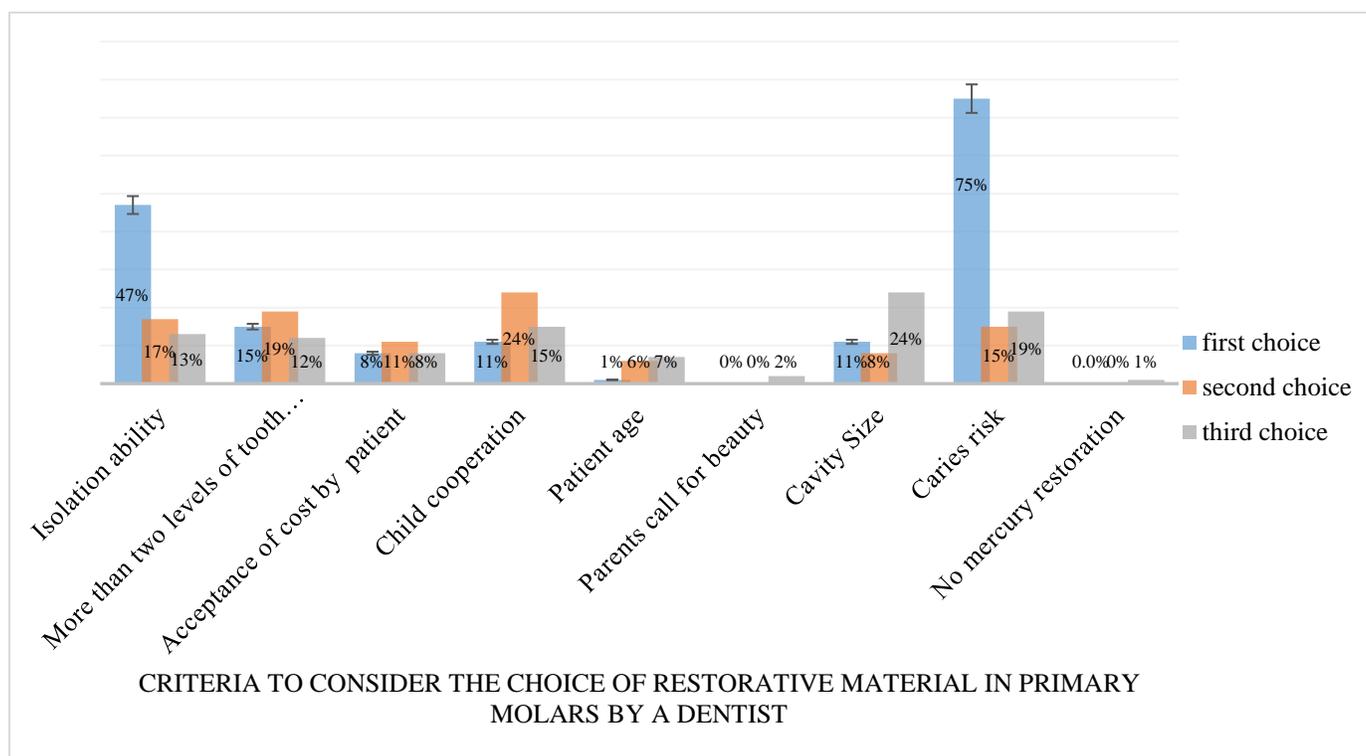


Figure 7 Frequency distribution of criteria for the choice of restorative material in primary molars by dentist

4. DISCUSSION

Evaluation of the similarities and differences between the views of parents and dentists helps to improve the communication between them. Currently, dental treatments are influenced by the stresses brought about by the community in the field of beauty, and affect the parents' and dentists' choices in treatment (Espelid et al., 2006).

Composite restorations

In this study, 44% of parents agreed to use composite for restoration of primary molars. The main reason for the parents' agreement is the beauty of this restoration material, and the main concern of most parents with each demographic characteristic was the durability of this restorative material. Parents' concerns with higher economical level are primarily durability and then toxicity, but lower income parents concern about durability than its cost. In parents with lower education, the main concern is about cost and the durability, but in parents with higher education level, most concern was durability. According to dentist's opinion, in the present study, the majority of parents did not worry about the toxicity of composite materials, which is similar to that of parents. These results are similar to the Peretz's study that both parents and children preferred resin composites. In the Peretz study, only 12% of

parents preferred amalgam and 40% had no opinion. In the Zimmerman study, pediatric dentists believe that parents and children preferred tooth-colored restorative materials (Zimmerman et al., 2009; Peretz & Ram, 2002).

Despite the interest of parents in composite restorations, the majority of dentists' selected material to restoration primary molar was amalgam (82%), and only 8% of dentists used composite to restoration class 2 cavities and based on their respond 10% usually, 66% sometimes and 24% never used composite restoration in primary molars. However, in other studies by Zimmerman, Guelmann, and Tran, used composites for the restoration of small and medium-sized class I and II cavities (Tran & Messer, 2003). In Lee's study, the majority of dentists used amalgam (57%) and subsequently composite (29%) to restore class 2 cavities in primary molars (Lee et al., 2004). The reason for disputes among dentists depends on the educational programs and the curriculum of universities, as in Australia, New Zealand, and Florida, dentists use composites more, while most North American dental schools consider amalgam as the first choice for class 1 and 2 restorations of primary molars (Guelmann et al., 2001). In Brazil and Japan, only 5% and 20% of educational curriculums considered composite restorations in primary molars (Lee et al., 2004). Unfortunately, there is no information on the amount of composite restoration training in pediatric dentistry curriculum in Iran. However, according to the results of this study, it seems that amalgam is also taught as a selective material for the two-level restoration of posterior primary molars in Iran.

Amalgam restorations

In this study, most parents' concerns in using amalgam as a restorative material in the first place are the lack of beauty and then its toxicity, and in particular, less people are concerned about its cost and durability. In particular, parents with higher income were not concerned about the durability and cost of this material. 40% of parents' concerns were about the lack of amalgam beauty and 33% about its toxicity. Because of durability and cost of this material, 62% of parents agree and even completely agree to use amalgam. Parents older than 40 years and low-educated parents, most of who are in one category, are clearly less concerned about the toxicity of amalgam resulting from the lack of awareness of this ambiguity regarding amalgam. However, high-income parents are equally concerned about the beauty and toxicity of amalgam. The probability of toxic reactions in the patient is very low due to the small amount of mercury in the teeth or the individual's sensitivity to it through the mercury dissolution of the surface of amalgam. Also, mercury in the gastrointestinal tract does not become fatal compounds and is excreted by the body (Spencer, 2004). Similar to our results in Zimmerman's study, it was observed that although the percentage of mercury released from amalgam is low, high-educated parents are more concerned about the use of amalgam, but the overall priority of parents in America is amalgam toxicity, which is in the second priority after beauty for Iranian parents (Zimmerman et al., 2009). In Peretz study, only 12% of parents preferred amalgam, and most parents were worried about the toxicity of amalgam, which was due to the result of the advertising campaign against amalgam and mercury found in some countries (Peretz & Ram, 2002). Although there are no laws to ban amalgam in any of the European countries, public recommendations are made regarding the non-use of amalgam in children and pregnant women in countries such as Canada, Austria, Germany, Sweden, Norway, Denmark, France and Finland. Also, 91% of dentists who did not use amalgam in the Lee study, did not declare the amalgam toxicity as its reason, and the American Dental Association has not restricted the use of amalgam because no proven evidence was seen on a link between chronic systemic diseases and amalgam (Lee et al., 2004).

In the survey, it was determined that 82% of Ahwaz dentists would prefer amalgam for the proximal class 2 cavity restoration. Then, 10% of the dentists chose stainless steel crown, 5% composite and 3% of resin modified glass ionomer. This is while, according to Guelmann study, resin-based materials were most commonly used in Class I and II cavities, and stainless steel crowns were selected in cases where 3 or more teeth were involved (Guelmann et al., 2001). Also, in Tran study, the willingness of pediatric and general dentists for class I and class II cavities in primary molars was tooth colored materials 92% and 84%, respectively. For restoration of cavities with more than two surfaces primary molars, 65% of dentists selected the tooth colored materials followed by crown (27%) and amalgam (8%) (Tran & Messer, 2003). In the Zimmerman study, 58% of pediatric dentists used amalgam to restoration class II cavities and in Lee study, 57% of dentists used this material to restoration class II cavities (Lee et al., 2004; Zimmerman et al., 2009). Based on those studies, 27%, 28% and 21% of dentists never used amalgam to restoration class II cavities, respectively (Lee et al., 2004; Zimmerman et al., 2009; Tran & Messer, 2003). In the present study, only 3.4% of dentists did not use amalgam and others used amalgam alone or in combination with other materials.

In the present study, according to the results of Ahwaz dentists, amalgam is preferred more which is contrary to other studies, which indicates that other countries are moving toward tooth-colored restorations, one of the causes of which can be the pressure exerted by parents. Also, many factors are important in decision making by dentist and this controversy is due to the high prevalence of caries in Iranian children (Pakshir, 2004).

Stainless steel crown

In the present study, 41% of parents agreed to use stainless steel crown, and 28% did not, and 50% worried about the beauty of this restorative material and 28% worried about its cost. Among these parents, the younger group was more concerned about the beauty of this material (60%). Parents with lower income were significantly more concerned about the cost of treatment than high-income parents, and parents with high education worried about the beauty of this restorative material. In Zimmerman's study, the most concern of parents about SSC in the first place was beauty and then cost, which is similar to our study (Zimmerman et al., 2009). SSCs are durable and cost effective restorations that are recommended for extensive and multi-surface restorations and in children with high risk of caries, and because of the complete crown covering its preventing recurrent caries in children (Pinkham et al., 2013) So, considering the benefits of these crowns, by explaining to parents about the cost and durability of these crowns, parents can be informed to enhance the adoption of these crowns.

In our study, 10% of dentists used SSC to restoration proximal class II cavities, and generally, 24% of dentists usually use SSC and 51% of them sometimes. In Tran's study, 8% of dentists used SSC to restore two separate cavities (Tran & Messer, 2003), and in the Zimmerman study, 93% of dentists used SSC to restoration class II cavities (Zimmerman et al., 2009). The reason for this difference is due to the participants in the study, which in our study were mostly young and general dentists, while in the Zimmerman study, pediatric dentists were included and in Tran's study were two general and pedodontist groups (Zimmerman et al., 2009; Tran & Messer, 2003).

In this study, 36% of the parents disagreed with the use of veneered crowns and 32% had no comments. The main concern (71%) was for costs and 13% for its durability. Of these, parents less than 30 years old and with lower income, were more concerned with the cost of treatment than other parents, and parents with high income and older than 40 years old more concerned about the durability of these crowns. In the opinion of parents in the MC Lean study, the majority were satisfied with the appearance of this restorative material in the anterior teeth, but after 6 months, the material showed a weakness in durability and was fractured (MacLean et al., 2007). In the study by Champagne, 94% of parents were satisfied with the crowns in the posterior teeth and their least satisfaction was about the appearance of the metal and the durability of these crowns, because in their study, 11% of veneered crown were fractured or completely detached (Champagne et al., 2007). According to other studies, parents' concerns about the durability of these crowns seemed reasonable, and these crowns are more expensive.

Effective factors in the selection of restorative material in primary teeth in dentists

The most used materials for dentists were amalgam alone 29.3%, and then amalgam and composite 30.6%, amalgam and stainless steel crown 23.6% and amalgam, composite and stainless steel crown with 15.9%. In the present study, the priorities for choosing the restorative material of primary molars by dentists were 74% isolation ability, 24% involvement of more than two surfaces of teeth, 17% child involvement and cavity size and 11% risk of caries and oral hygiene, respectively. These priorities are somewhat different from the results of other papers. In Zimmerman's study the isolation and pulp therapy, cavity size, cavity depth and oral hygiene, were the most important factors, respectively (Zimmerman et al., 2009). In the Tran study, the most important factors in the choice of restorative material were child's age, history of caries, isolation, child cooperation, and cavity size. In the Lee Pair study, the priorities of dentists in choosing the restorative material are as follows: insurance coverage, isolation ability, patient cooperation, oral hygiene, spread of decay beneath the gum and cementum, extensive cavities (Tran & Messer, 2003). In this study, the reasons for the choice of amalgam by dentists were durability, mechanical properties, less placement time and less need for patient cooperation and the main reasons for placing composites in class II cavities were patient preference and beauty. In Zimmerman's study, parental preferences had a significant effect on material selection by dentists (Zimmerman et al., 2009). Based on dentists responds, isolation, oral hygiene and cavity size were important in the choice of restorative materials. Considering that the composite material has high technical sensitivity and is sensitive to moisture, the possibility of good isolation and extension of the cavity below the gingiva, are important in choosing this material (Pinkham et al., 2013).

The attitude of dentists to parents' concerns

Parents' concerns from the perspective of dentists are durability 36%, cost 29%, beauty 23%, and toxicity 12% of dental materials, respectively. In dentist's point of view, parents are not sensitive to the concerns about the mercury of amalgam, though most parents (53%) are concerned about this, and 78% do not have the concern for toxicity of tooth-colored materials.

By evaluating the concerns of parents about restorative materials, it can be concluded that dentists are well aware of the parents' concerns for beauty, durability and cost. Also, dentists are not concerned about the toxicity of mercury in amalgam for parents, while after beauty, the most important cause of parental concern is mercury toxicity. According to dentists' responses to the question

about parents' concerns about the mercury used in amalgam, it became clear that in most cases, by ensuring and discussing with parents about the scarcity of mercury released, this concern is resolved.

Regarding the controversy between parents and dentists in the selection of restorative materials, in Guelmann's study, parents never pressured the dentists to use a particular material, and dentists rarely used amalgam alone (Guelmann et al., 2001). In Zimmerman's article, many dentists choose material that suits the wishes of parents, where dentists use less amalgam and more tooth-colored materials, parents less insist (Zimmerman et al., 2009). In Woo's study, the most important factor in choosing the treatment plan by parents was trust to the dentist (Woo et al., 2005). The dentist's ability to gaining trust and informed parents depends on the good relationship between the dentist and patient, and is effective in choosing the treatment plan by patient.

According to the current study, most parents are not inclined or willing to replace tooth-colored material with amalgam and dentists' reaction to parents' insistence was often re-recommending the appropriate material and were rarely did parents requests with a parental consent.

In the present study, in the dentist's decision to choose between composite and amalgam in the class II cavities of the ideal primary molars, 9% of parents had a primary role, 56% had a secondary role and 35% had no role at all. This indicates that parents' concerns and their views are not considered by the dentist. Regarding the difference in attitudes of parents and dentists about restorative materials, parents may be dissatisfied, which is suggested to offer a brief description of the type of treatment to parents. Dentists are required to inform parents about alternative documented techniques, assessing the risks of treatment, advantages and disadvantages of treatment and financial issues.

5. CONCLUSION

Dentists need to have the skills to understand the parents' demand, and parents need to know why dentists perform treatment contrary to their demand. Dentists should have good communication skills and adequate knowledge about the risks of treatment, so they can satisfy parents in treatment of their children teeth. Implications for research are as follows: using the consent form to perform the repairs considered by parents and contrary to the dentists. Holding the retraining and continuous training courses in pediatric dentistry. Encouraging dentists to reconsider the use of restorative materials and communicate effectively with the patient

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Ethical Code

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Conflict of Interest

There is no Conflict of Interest.

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