

Restorative Treatment Decisions of Croatian University Teachers

Anja Baraba¹, Sophie Doméjean², Hrvoje Jurić³, Ivar Espelid⁴, Anne B. Tveit⁵ and Ivica Anić¹

¹ University of Zagreb, School of Dental Medicine, Department of Endodontics and Restorative Dentistry, Zagreb, Croatia

² University of Auvergne, Faculty of Dentistry, Department of Operative Dentistry, Clermont-Ferrand, France

³ University of Zagreb, School of Dental Medicine, Department of Pediatric Dentistry, Zagreb, Croatia

⁴ University of Oslo, Faculty of Dentistry, Department of Pedodontics, Oslo, Norway

⁵ University of Oslo, Faculty of Dentistry, Department of Cariology, Oslo, Norway

ABSTRACT

This study aimed to identify differences in diagnostic criteria and restorative treatment among Croatian university teachers. The questionnaire was distributed to 120 Croatian university teachers in Zagreb and Rijeka. Responses were collected from 59 (49.2%) university teachers. Treatment thresholds for hypothetical approximal and occlusal caries, as well as most favored types of restorative techniques and materials were assessed. The majority (34%) of the respondents would intervene for an approximal caries lesion at the enamel-dentin junction. The leading strategy for occlusal caries was postponing operative treatment until the caries lesion was in the outer third of dentin and removing caries tissue only. Composite resin was the predominant material of choice for restoration of approximal and occlusal caries (70% and 81% respectively). More than half (54%) of Croatian university teachers believed the radiographs underestimated the depth of the caries lesion compared with clinical finding. Findings of this study should be a guideline for Croatian university teachers for a more consistent and modern teaching on the subject of caries management.

Key words: dental caries, dental treatment, university teachers

Introduction

Clinical decision making in restorative dentistry takes place daily in practice, ranging from the diagnosis of caries, selection of preparation techniques and dental materials used for a restorative procedure for individual patients.

Preventive strategies and non-invasive therapies are preferred over operative treatments, which are undesirable unless the carious lesion has reached dentin or the cavitation stage¹. Clinical decision should also take into account individual patient characteristics determining their caries susceptibility^{2,3}. Dental cariology is an important part of dentistry and deserves further development and emphasis in dental schools' curriculum. Only evidence-based teaching can result in embracing the modern principles of minimally invasive dentistry⁴. Dental school curriculum and continuing professional education should provide knowledge of new concepts of minimally invasive approach in cariology and restorative dentistry for the clinicians to apply in patient care.

The restorative treatment decisions in everyday dental practice have been studied using questionnaires in Norway, Sweden, Denmark, Western Australia, Scotland, France and Iran. These studies showed wide range of differences in treatment planning and decisions between different operators in different countries^{5–15}. A similar study was conducted among Croatian dentists recently. It would be interesting to assess the possible correlation between the results of the studies mentioned and teaching in dental schools regarding cariology and restorative dentistry. The studies on treatment thresholds, restorative methods and materials chosen by university teachers could be a first step in identifying variations in caries management.

The aim of this study was to assess restorative treatment decisions of Croatian university teachers and their approaches regarding some aspects of caries diagnosis and management.

Materials and Methods

In Croatia, there are two dental schools. The questionnaire was distributed to teachers working in School of Dental Medicine, University of Zagreb and at the Dental Department, School of Medicine, University of Rijeka. University teachers were asked to fill out questionnaires anonymously. The total number of questionnaires distributed was 120 and the responses were collected from 59 (49.2%) university teachers. The questionnaire had two sections: one a Croatian translation of questionnaire of Espelid et al.¹² and another section was taken from a French study¹⁴, with questions about the dentists approaches concerning caries.

In the first section of the questionnaire, a theoretical 20-year-old patient, with good oral hygiene, low caries activity and visiting a dentist annually was described. Figures, included as an addition to questions, showed different radiographic stages of approximal caries (Figure 1a), clinical appearance of occlusal (Figure 1b) and combina-

tion of clinical and radiographic findings of questionable caries lesions (Figure 1c and 1d). University teachers treatment thresholds for hypothetical approximal and occlusal caries presented on figures were assessed, as well as most favored types of restorative techniques and materials. Concerning restorative techniques for approximal caries, the teachers had a choice between traditional class II, tunnel and saucer-shaped preparations, for occlusal caries lesion a choice was removing carious tissue only or opening the whole fissure system. For questionable caries, dentists were offered the following treatments: no treatment, application of fluorides, fissure sealing, removing carious tissue only, combination of fissure sealing and operative treatment or opening the whole fissure system. Answers offered for restorative materials for approximal, occlusal and questionable caries were: amalgam, composite resin, conventional glass ionomer cement (GIC), resin modified GIC, composite resin plus GIC and other.

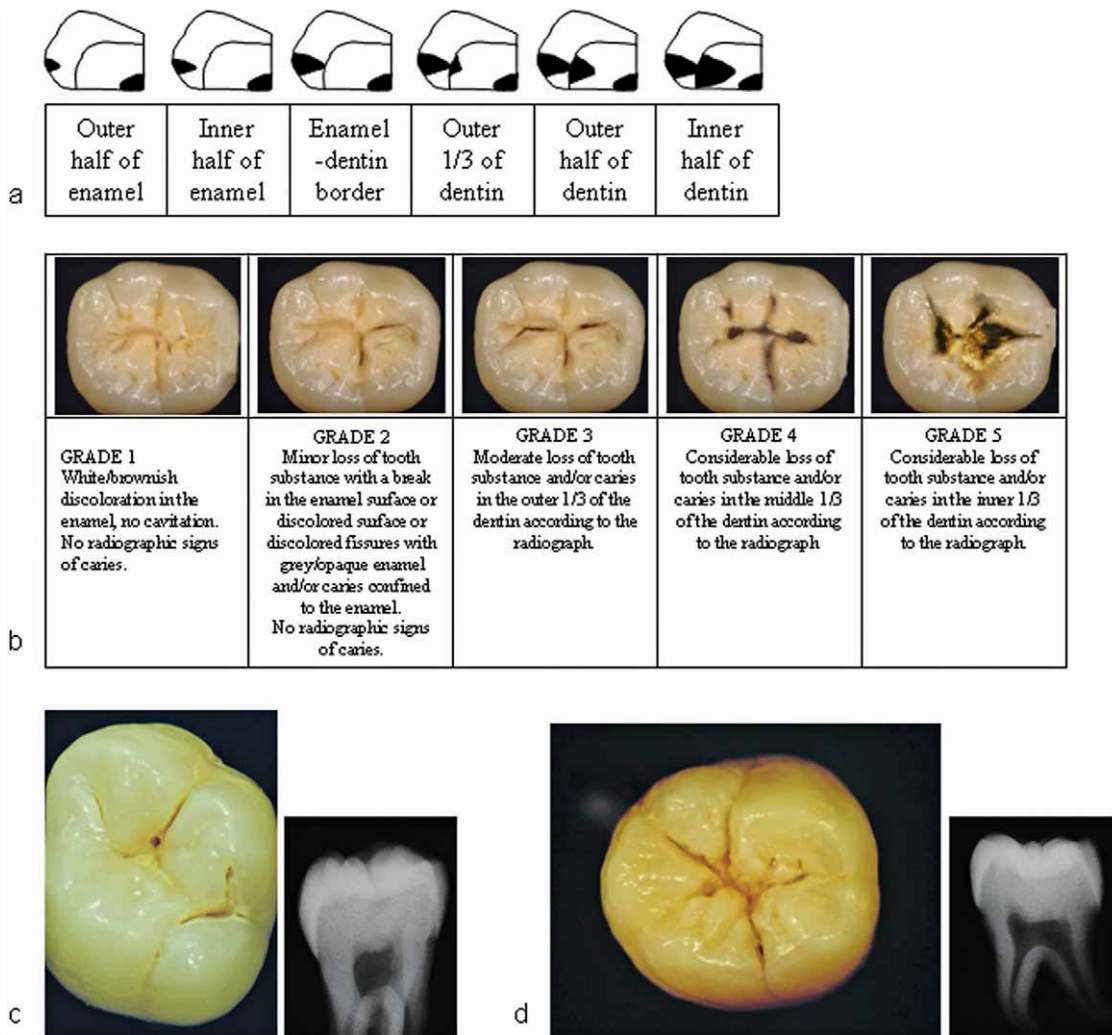


Fig. 1. a) Different radiographic stages of approximal caries lesion; b) clinical appearance of occlusal caries of different severities (grade 1-5); c) tooth A-radiographic and clinical appearance; d) tooth B- Radiographic and clinical appearance.

The items in the first section of the questionnaire are detailed below:

Figure 1a:

Item 1: Which lesion(s) do you think require(s) immediate restorative treatment?

That is, the lesion(s) for which you would not postpone restorative treatment under any circumstances.

Item 2: Which type of preparation would you prefer for the smallest of the lesions you decided to drill and fill?

Item 3: What restorative material would you choose for the smallest approximal lesion that you would restore?

Figure 1b:

Item 1: Which lesion(s) do you think require(s) immediate restorative treatment?

That is, the lesion(s) for which you would not postpone restorative treatment under any circumstances.

Item 2: Which type of preparation would you prefer for the smallest of the lesions you decided to drill and fill?

Item 3: What restorative material would you choose for the smallest occlusal lesion that you would restore?

Figure 1c:

Item 1: Do you think that, from its clinical and radiographic appearance, tooth A has occlusal (enamel or dentin) caries?

Item 2: How would you treat this occlusal surface?

Item 3: If you would restore the tooth, what material would you use?

Figure 1d:

Item 1: Do you think that, from its clinical and radiographic appearance, tooth B has occlusal (enamel or dentin) caries?

Item 2: How would you treat this occlusal surface?

Item 3: If you would restore the tooth, what material would you use?

In the second section, the following questions were asked:

What do you think about the radiographic appearance of approximal caries compared with clinical observations? (a) The radiographic image underestimates the true depth. (b) The radiographic image correctly represents the true depth. (c) The radiographic image overestimates the true depth.

What is your estimate of the average time it would take for an approximal lesion to progress from outer enamel to dentin (in the permanent dentition)? The patient is 20 years old and sees his dentist once a year and has adequate hygiene and uses fluoride toothpaste.

You have radiographically detected an approximal lesion near the enamel-dentin junction. The patient is 20 years old and sees his dentist once a year and has adequate hygiene and uses fluoride toothpaste. »The approximal lesion must be left unrestored for at least 6 months in order to determine if it is an active lesion and to evalu-

ate its progression rate.« Do you agree or disagree, or are you uncertain, with respect to this statement?

»Cavitation of an approximal lesion is usually not visible to the naked eye even if the lesion has reached the enamel-dentin junction.« Do you agree or disagree, or are you uncertain, with respect to this statement?

»What is the most important in your opinion?« (a) It is more important to fill all carious teeth (accepting the risk of some unnecessary restorations) (b) It is more important not to fill sound teeth unnecessarily (accepting the risk of not restoring some carious lesions.) (c) These risks of errors are of equal importance.

The χ^2 -test was used to test the dentists' treatment thresholds, selection of preparation techniques, restorative materials and correlation to their age and gender. The level of significance was set at 5%.

Results

The majority of Croatian University teachers would restore operatively the approximal lesion that has reached enamel-dentin junction (Figure 2). Forty-seven percent of teachers preferred the tunnel preparation, 36% saucer-shaped preparation and 17% traditional class II preparation. Younger teachers preferred tunnel preparation while the majority of older teachers chose classical II class preparation for approximal caries ($p=0.01999$), (Figure 3). The majority of university teachers chose com-

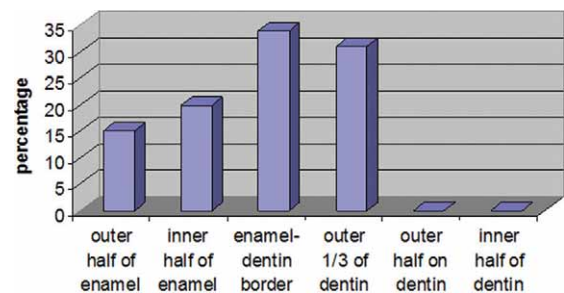


Fig. 2. The earliest stage of approximal caries lesion at which Croatian teachers would perform restorative treatment.

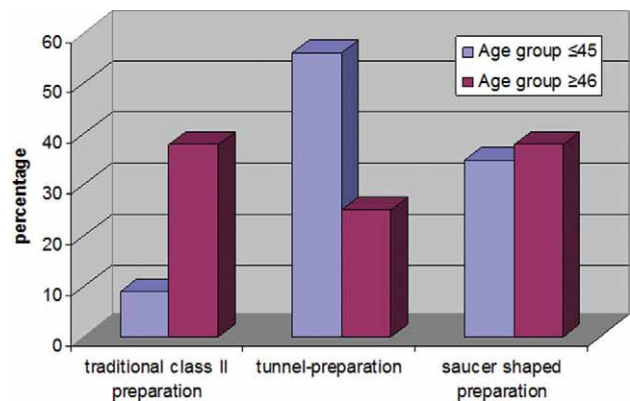


Fig. 3. Percentage distribution of Croatian university teachers regarding preparation techniques in different age groups.

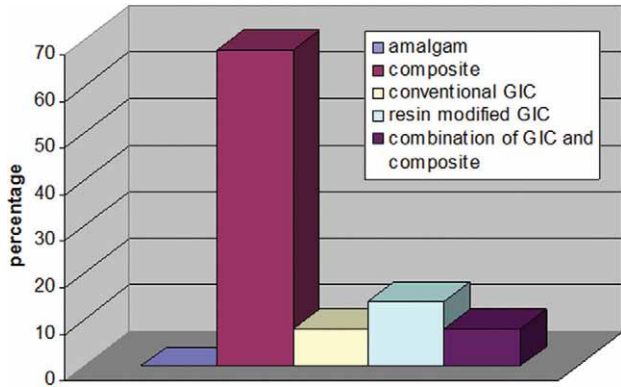


Fig. 4. Restorative material of first choice for approximal caries among Croatian university teachers.

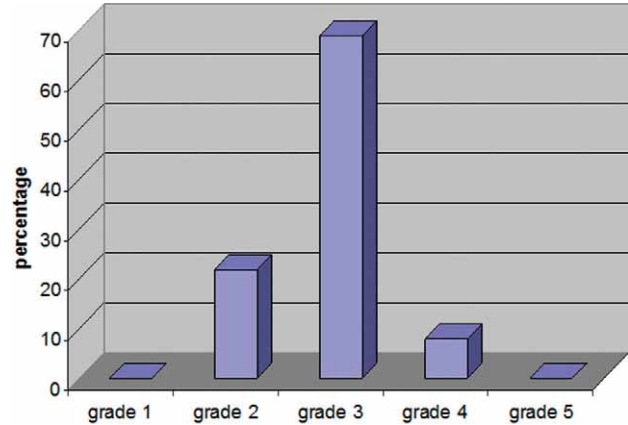


Fig. 5. The earliest stage of occlusal caries at which Croatian university teachers would intervene with operative treatment.

posite resin for restoration of approximal caries lesion and none of the teachers suggested amalgam filling (Figure 4).

Figure 5 shows the decisions of University teachers regarding the smallest occlusal caries lesion they would restore operatively. Eighty percent of teachers would remove only the affected areas without preparing the whole fissure system. Younger teachers were more prone to removal of caries tissue only in comparison to older teachers ($p=0.04576$), (Figure 6). Composite resin was chosen most often as a restorative material (81%), 10% chose combination of composite and GIC, 7% conventional or resin modified GIC and only 2% would use amalgam for restoration of occlusal lesion.

Figure 7 shows the university teachers' diagnosis and treatment for tooth A. The restorative material of choice was composite resin (80%), resin modified GIC (12%) or combination of composite and GIC (8%). Older teachers

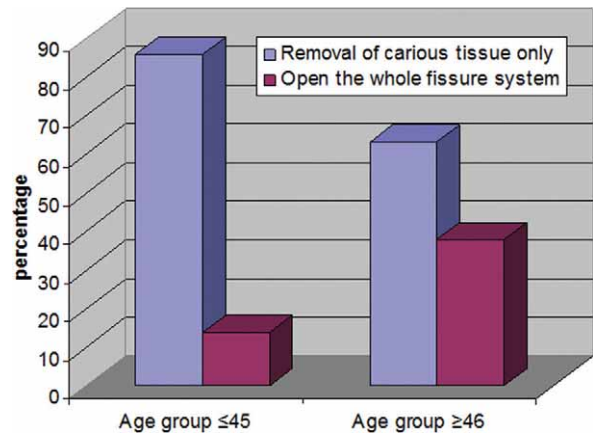


Fig. 6. Selection of preparation techniques for occlusal caries in different age groups.

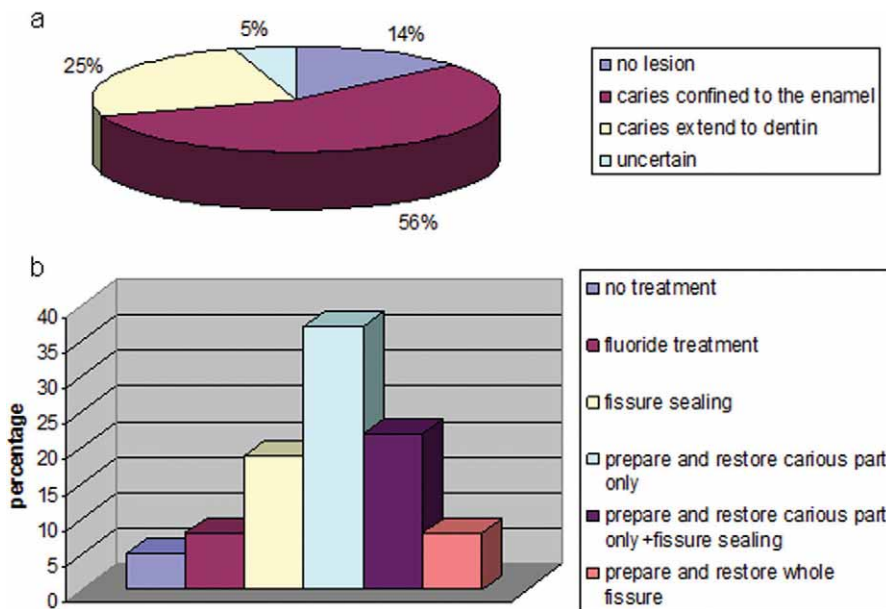


Fig. 7. a- Croatian university teachers diagnosis for tooth A; b- treatment suggestions for tooth A.

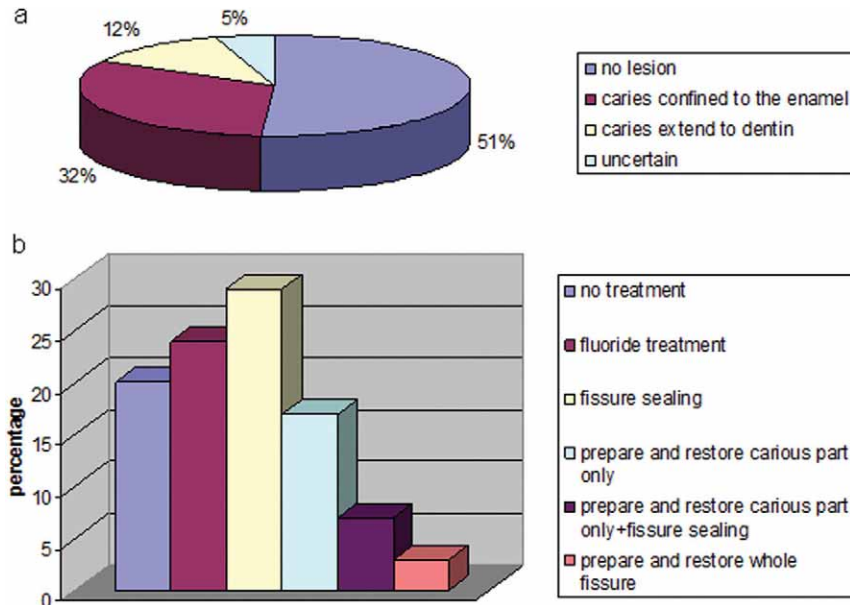


Fig. 8. a-Croatian university teachers diagnosis for tooth B; b- treatment suggestions for tooth B.

chose resin modified GIC more often than younger ones ($p=0.03959$).

Figure 8 shows the university teachers' diagnosis and treatment for tooth B. Eighty-eight percent of teachers would use composite resin material for restoration and 12% resin modified GIC.

The majority of Croatian university teachers believed the radiographs underestimated the depth of the caries lesion compared with clinical finding (Figure 9). Thirty percent of teachers thought it would take more than two years for caries to progress from outer enamel to dentin (Figure 10). The majority of teachers (51%) would not leave the approximal lesion near enamel-dentin junction unrestored for six months, but 39% would rather observe this lesion without restorative treatment, while 10% were uncertain about this decision. Forty eight percent of teachers thought cavitation reaching enamel-dentin junction was not visible clinically, 44% disagreed and 8% were uncertain. Forty one percent of teachers considered it was equally important to avoid all types of errors, to fill all caries lesions and to avoid filling any sound

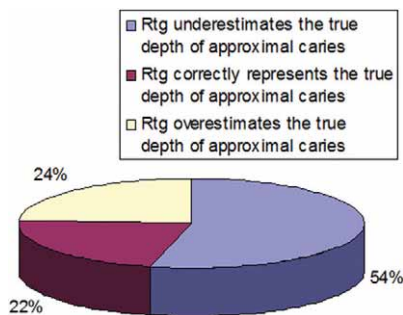


Fig. 9. Croatian university teachers beliefs regarding radiographic appearance of approximal caries.

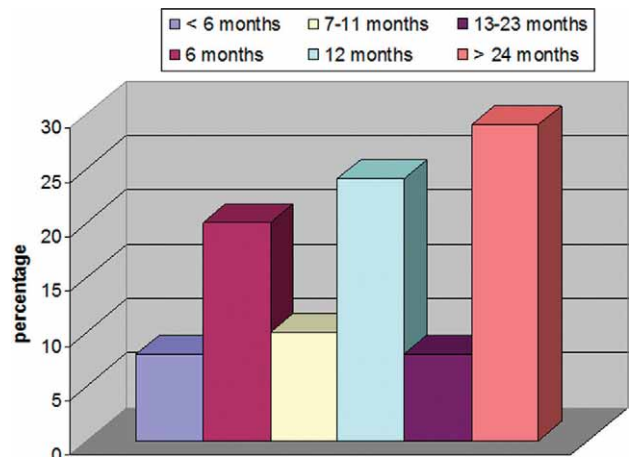


Fig. 10. Croatian university teachers opinions on average time for approximal caries to progress from outer enamel to dentin.

teeth, 31% considered it was important not to do unnecessary restorative treatments while 28% thought it was most important to fill all caries lesions.

Discussion and Conclusion

The present study aimed to determine the restorative decisions, knowledge and approaches of Croatian university teachers. Within the limitations of this study, the results obtained provide a useful insight into approaches of Croatian university teachers regarding restorative treatment.

The treatment criteria reported in questionnaire studies do not entirely reflect clinical decisions, but still offer an insight in their treatment philosophies^{9,10}. Age,

dental status and regularity of attendance to the dental office affect the dentist's decisions¹⁶ and to limit the response variance a theoretical patient was described in the questionnaire.

The attitudes of Croatian university teachers differed somewhat from those of Croatian dentists working in private practices and Public Dental Health Services and Croatian dentists in Split and Dalmatia County¹⁷. Teachers tended to postpone the operative treatment for an approximal caries. Regarding the preparation technique for approximal lesion, both the teachers and the general practitioners in Croatia and dentists in Split and Dalmatia County chose tunnel preparation¹⁷. While only 17% of teachers would use traditional II class preparation, Croatian dentists and Croatian dentists in Split and Dalmatia County seemed to choose it over saucer-shaped preparation¹⁷. The opinions on restorative materials were similar, with composite resin as the choice of the majority of Croatian dentists, Croatian dentists in Split and Dalmatia county and university teachers¹⁷. Teachers in Croatia would not use amalgam and neither would Croatian dentists in Split and Dalmatia County¹⁷. The decisions on occlusal caries were similar in Croatia between the practitioners and the teachers concerning the treatment threshold, preparation technique and restorative material¹⁷. The leading strategy was postponing operative treatment until the caries lesion was in the outer third of dentin, removing caries without preventive extension and using composite material for filling. There was a good agreement between practitioners and university teachers in Croatia regarding questionable occlusal car-

ries¹⁷. Croatian teachers were more inclined to non-operative procedures in comparison to practitioners. The restorative decisions and approaches regarding caries of Croatian university teachers were similar to those of French university teachers¹⁴.

Taking in consideration the results of this study, Croatian university teachers' restorative treatment decisions show wide variation. However, university teachers in Croatia seem to intervene operatively at a later stage and are more familiar with non-operative strategies.

Surveys of the thresholds, materials and techniques used in restorative treatment are considered to provide valuable insight into the extent to which new materials and techniques are applied in the practice. In addition, such surveys among university teachers serve an important purpose to those responsible for ensuring that dental curricula are contemporary. Teaching programs in North America, Europe and Japan have shown marked variations in education of dental students^{18–22}. Therefore, the results of such studies should help in creating more standardized criteria in teaching cariology and restorative dentistry in dental schools. Moreover, this study offers the possible explanation of differences in treatment planning and decisions among dentists in Croatia, which could be influenced by the attitudes of Croatian university teachers.

The findings of this study should be a guideline for reducing variability in restorative decisions among university teachers and to monitor future changes and compare the results with similar studies.

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H. Jurić

University of Zagreb, School of Dental Medicine, Department of Paediatric Dentistry, Gundulićeva 5,
10000 Zagreb, Croatia
e-mail: juric@sfgz.hr

ODLUKE HRVATSKIH PROFESORA NA STOMATOLOŠKIM FAKULTETIMA O RESTAURATIVNOM TRETMANU

S A Ž E T A K

Cilj ovog istraživanja je bio ustanoviti razlike u odlukama hrvatskih profesora na stomatološkim fakultetima o restaurativnom tretmanu. Upitnik je podijeljen profesorima (120) na stomatološkim fakultetima u Zagrebu i Rijeci. Upitnik je ispunilo 59 (49,2%) profesora. Upitnik je poslužio za procjenu pragova za restaurativni tretman hipotetskih aproksimalnih i okluzalnih karijesnih lezija, vrste restaurativnih tehnika preparacije i materijala. Većina profesora (34%) je odabrala restaurativni tretman za aproksimalne lezije koje su dosegule caklinsko-dentinsko spojište. Većina profesora bi uklonila okluzalni karijes koji je dosegnuo vanjsku trećinu dentina te bi uklonili samo karijesom zahvaćeno tkivo. Većina profesora je izabrala kompozit kao restaurativni materijal za aproksimalni i okluzalni karijes (70% i 81%). Više od polovice profesora (54%) vjeruje da rtg-snimke prikazuju karijes manjim u usporedbi s kliničkim nalazom. Rezultati ovog istraživanja mogu poslužiti kao smjernica za suvremeniji pristup u poučavanju o liječenju karijesa.