REVISTA DA FACULDADE DE ODONTOLOGIA DE PORTO ALEGRE
V. 64 (jan./dez. 2023) – ARTIGOS ORIGINAIS
DOI: 10.22456/2177-0018.128961

UNDERGRADUATE DENTAL STUDENTS AND DENTISTS' ACCEPTABILITY AND KNOWLEDGE ABOUT SELECTIVE CARIES TISSUE REMOVAL

Aceitabilidade e conhecimento sobre remoção seletiva de tecido cariado de graduandos em odontologia e cirurgiões-dentistas

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Data de envio: 19/12/2022 **Data de aceite:** 22/03/2023
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ABSTRACT

Aim: The aim of this study was to evaluate the acceptability and knowledge of undergraduate dental students and dentists on selective caries tissue removal (SCTR). **Materials and Methods:** Third- and fourth-year Dentistry undergraduates (Group 1) and graduates working in a Hospital Dentistry Center (Group 2) were included in the study. Participants anonymously and confidentially answered a validated questionnaire containing eleven questions on the diagnosis and management of deep caries lesions. Pearson's Chi-square test and multivariate logistic regression compared the answers ($p<0.05$). **Results:** Total sample comprised 146 participants. Of these, 81.5% were female; 52.05% were graduates and the most prevalent age group was 18-29 years old (85.62%). Sixty-nine participants chose stepwise caries removal ($p=0.027$). The logistic regression analysis showed statistically significant differences. The participants who considered pulp wall moist have approximately eight times more likelihood to choose an invasive treatment ($p=0.028$). Those who chose endodontic treatment as an option for two-year survival have three times more likelihood to choose an invasive treatment ($p=0.032$). Those who affirmed that the carious dentin close to the pulp should not be removed had almost three times more likelihood to choose minimally invasive treatments ($p=0.031$). **Discussion:** Studies with questionnaires can be useful tools to detect whether the students and dentists are following the most current evidences to treat deep carious lesions. **Conclusion:** The participants had certain level of knowledge on SCTR, but the technique acceptability lacked consensus.

Keywords: Surveys and questionnaires. Tooth. Dental caries. Dentists. Practice Patterns, Dentists'.

RESUMO

Objetivo: Avaliar a aceitabilidade e o conhecimento de estudantes de graduação em Odontologia e cirurgiões-dentistas sobre a remoção seletiva de tecido cariado (RSTC). **Materiais e Métodos:** Participaram do estudo graduandos do terceiro e quarto ano de Odontologia (Grupo 1) e egressos de um Centro Hospitalar de Odontologia (Grupo 2). Os participantes responderam de forma anônima e confidencial um questionário validado contendo onze questões sobre diagnóstico e manejo de lesões cariosas profundas. Teste qui-quadrado de Pearson e regressão logística multivariada foram aplicados ($p<0.05$). **Resultados:** A amostra total foi composta por 146 participantes. Destes, 81.5% eram do sexo feminino; 52.05% eram graduados e a faixa etária mais prevalente foi de 18 a 29 anos (85.62%). Sessenta e nove participantes escolheram o tratamento expectante ($p=0.027$). A análise de regressão logística mostrou diferenças estatisticamente significativas. Os participantes que consideraram a parede pulpar úmida têm aproximadamente oito vezes mais chances de escolha pelo tratamento invasivo ($p=0.028$). Aqueles que escolheram o tratamento endodôntico como opção de sobrevida em dois anos têm três vezes mais chances de optar pelo tratamento invasivo ($p=0.032$). Aqueles que afirmaram que a dentina cariada próxima à polpa não deveria ser removida tiveram quase três vezes mais chances de optar por tratamentos minimamente invasivos ($p=0.031$). **Discussão:** Estudos com questionários podem ser ferramentas úteis para detectar se estudantes e cirurgiões-dentistas estão seguindo as evidências mais atuais para o tratamento de lesões cariosas profundas. **Conclusão:** Os participantes tinham certo nível de conhecimento sobre RSTC, mas a aceitabilidade da técnica carecia de consenso.

Palavras-chave: Inquéritos e questionários. Dente. Cárie dentária. Odontológos. Padrões de prática odontológica.

INTRODUCTION

Decades ago, nonselective carious tissue removal to hard dentin (formerly known as complete carious tissue removal) was the operative dentistry gold standard[1]. The rationale behind this concept is the comprehension about caries as an infectious disease caused by specific bacteria that required eradication and the limited choice of restorative materials that needed a large cavity preparation[2].

Different carious lesion stages and activity demand different approaches[3]. Consequently, the dentist should be aware of the current evidences on minimally invasive techniques[4,5]. To date, mainly for deep carious lesions (inner pulpal third or quarter of the dentin radiographically), the nonselective removal shifted to selective carious tissue removal – SCTR[1-5]. SCTR is the removal to soft or firm dentin, depending on the carious tissue deepness towards the pulp[1]. For deep carious lesions, selective removal to soft dentin aims at preserving the pulp without signs of pain symptomatology and irreversible pulp inflammation[1,6]. SCTR maintains the tooth structure and integrity by keeping dentin thickness, reduces the risk of pulp exposure, and assures long-term tooth longevity[7-10]. Furthermore, minimally invasive approaches enable greater access to low cost and less complex treatments[11,12].

Despite the contemporary approach of the amount of carious tissue removal for deep lesions, data about how the dentists treat these lesions are extremely limited[2]. The difficult in studying SCTR is that the subjective criterion may be not reproducible specially to measure the amount of remaining carious tissue[1,2]. Although subjective, the operator's tactile sensation is optimum to guide the dentists[3].

It is unclear whether SCTR knowledge is not generally practiced or whether minimally invasive approaches are only practice among younger undergraduates[2]. Notwithstanding, the literature lacks studies on the knowledge of both dentistry undergraduates and dentists about minimally invasive approaches for carious tissue removal. Validated questionnaires with simple application are an important research method and may be used to overcome this issue[2,13,14]. Therefore, this study aimed to evaluate the acceptability and knowledge of undergraduate dental students and dentists on selective caries tissue removal.

MATERIAL AND METHODS

Ethical approval and consent to participate

This study was approved by the Institutional Review Board (CAAE: 71651617.0.0000.5417). The participants were instructed about the research and agreed to participate by signing a free and clarified consent form.

Sample selection: inclusion criteria and determination of the groups

The inclusion criteria comprised junior (third year) and senior (fourth) undergraduates regularly enrolled in a Dentistry Course and dentists working at a Hospital. Exclusion criteria comprised incomplete filling of the questionnaires.

The study groups were divided according to: Group 1 – junior and senior undergraduates and Group 2 – dentists working at a Hospital. The group assignment was blinded by the researcher[15].

Sample size calculation

Qualitative interviews are generally not subject to sample size estimation[16]. However, according to previous studies[14,17,18], a minimum sample size of 100 participants were considered for this study.

Research conduction

A validated and adapted questionnaire translated to Portuguese evaluated the knowledge and acceptability of undergraduates and dentists on minimally invasive SCTR[2]. Highlighting the selective carious removal technique, which consist in a deep carious cavity. The questionnaire was composed of closed questions ("yes" or "no", "disagree" or "totally agree") and multiple-choice questions. Eight questions determined the level of knowledge of the participants on minimally invasive SCTR.

The study operators monitored the application of the questionnaires. All participants were instructed to answer the questions without the aid of scientific material, books, electronic devices and without the aid of peers. Undergraduates answered the questionnaire within the university, while dentists, at the Hospital. No questionnaire was sent by email. The questionnaire was applied privately. Confidentiality and anonymity were assured.

Statistical analysis

All statistical analyses were performed with SPSS Statistics 21.0 software (IBM Corp. Armonk, NY, USA). The sample was dichotomized according to age (18-29 years old - young people, and over 30 years old - adults, following Brazilian legislation[19]); gender (male and female), academic level (undergraduates and dentists), and answer type ("disagree" or "totally agree") and compared by Pearson's chi-square test and Fisher's exact test ($p<0.05$). To verify the impact of each variable on this study odds ratio, multivariate logistic regression was applied ($p<0.05$).

RESULTS

One hundred and fifty questionnaires were answered, but four were excluded because of incomplete filling of the form. Of the final total sample (n=146), 119 (81.5%) were female and 27 (18.5%) were male, 70 (47.95%) were undergraduate dental students and 76 (52.05%) were dentists. The most prevalent age group was 18-29 years-old (85.62%).

The frequency of the responses to question #11 about the preference regarding a more (item A) or less (item B) invasive treatment showed that 4.8% totally disagree with both options, while 6.8% agreed with both options, equally choosing more and less invasive treatments. Pearson's chi-square test and Fisher's exact test verified the variance of the questionnaire responses by directly associating the participants' answers to the items A and B (study odds ratio) (Tables 1 and 2).

There was a statistically significant difference in the following parameters; "Gender: Female", totally disagree n=93 vs. totally agree n=26 ($p=0.042$); "Carious tissue removal: clinical criteria, Consistency, Soft dentin on the cavity floor", 23 vs. 16 ($p=0.009$) and, "Leathery dentin on the cavity floor", 46 vs. 8 ($p=0.025$); "Moist, Very moist pulpal wall", 2 vs. 5 ($p=0.004$); "Deep carious dentin removal, I remove all dentin, if pulp exposure occur, I perform direct pulp capping", 19 vs. 13 ($p=0.024$); "You would expect a two-year survival for which of the following options, Endodontic treatment", 89 vs. 23 ($p=0.015$) (Table 1).

Table 1 – Questionnaire's responses relative to the response for question 11/item A (Pearson's chi square test and Fisher's exact test).

11A) I prefer a more invasive treatment if this increase the longevity of my restorations	**Totally disagree** n (%)	**Totally agree** n (%)	***P***
1) Gender			
Female	93 (63.7)	26 (17.8)	**0.042***
Male	16 (11)	11 (7.5)	
2) Age group			
18 – 29	95 (65.1)	30 (20.5)	0.363
30 or +	14 (9.6)	7 (4.8)	
3) Academic titles			
Undergraduates	53 (36.3)	17 (11.6)	0.778
Dentists	56 (38.4)	20 (13.7)	
4) Carious tissue removal: clinical criteria			
A) Consistency			
1.Soft dentin on the cavity floor	23 (15.8)	16 (11)	**0.009***
2.Leathery dentin on the cavity floor	46 (31.5)	8 (5.5)	**0.025***
3.Firm dentin on the cavity floor (resistant to cut)	39 (26.7)	11 (7.5)	0.503
4. Consistency is not important to evaluate carious tissue removal	1 (0.7)	2 (1.4)	0.096§
B) Color			
1. Slightly darkened dentin	38 (26)	7 (4.8)	0.07
2. Very darkened dentin	22 (15.1)	10 (6.8)	0.385
3. Dentin with healthy color (yellowish)	27 (18.5)	10 (6.8)	0.785
4. The color is not important to evaluate carious tissue removal	22 (15.1)	10 (6.8)	0.385
C) Moist			
1. Very moist pulp wall	2 (1.4)	5 (3.4)	**0.004***§
2. Slightly moist pulp wall	35 (24)	9 (6.2)	0.373
3. Dry pulp wall	43 (29.5)	11 (7.5)	0.290
4. Moist is not important to evaluate carious tissue removal	29 (19.9)	12 (8.2)	0.496
5) Excavation method			
Round low-speed burs	59 (40.4)	21 (14.4)	0.781
Hand excavators	50 (34.2)	16 (11)	
6) Deep carious dentin removal			
A) I remove all dentin, if pulp exposure occur, I perform direct pulp capping	19 (13)	13 (8.9)	**0.024***
B) I remove all dentin, if pulp exposure occur, I perform the endodontic treatment	1 (0.7)	0 (0)	0.559§
C) I perform excavation and some dentin is left. Later, I perform total removal (two steps)	75 (51.4)	21 (14.4)	0.182
D) I perform excavation and some dentin is left. I remove all caries of the lateral walls and perform definitive restoration	14 (9.6)	3 (2.1)	0.438§
7) Use of pulp liners			
A) Calcium hydroxide cement	77 (52.7)	31 (21.2)	0.115
B) Glass ionomer cement (Vitrebond®)	30 (20.5)	5 (3.4)	0.085
C) Adhesive system	1 (0.7)	1 (0.7)	0.420§
D) Other liner	1 (0.7)	0 (0)	0.559§

Table 1 – Questionnaire's responses relative to the response for question 11/item A (Pearson's chi square test and Fisher's exact test).

11A) I prefer a more invasive treatment if this increase the longevity of my restorations	**Totally disagree** n (%)	**Totally agree** n (%)	***P***
8) You would expect a two-year survival for which of the following options:			
A) Indirect pulp capping	83 (56.8)	29 (19.9)	0.781
B) Incomplete excavation (selective carious tissue removal)	32 (21.9)	17 (11.6)	0.065
C) Direct pulp capping	68 (46.6)	23 (15.8)	0.981
D) Endodontic treatment	89 (61)	23 (15.8)	**0.015***
9) How do you fell about leaving carious tissue under a restoration?			
A) Caries microorganisms have to be removed completely, otherwise caries may progress	30 (20.5)	16 (11)	0.075
B) Caries microorganisms do not have to be removed completely because the restoration will provide the hermetic sealing and no lesion progression will occur	79 (54.1)	26 (17.8)	0.796
C) Caries should always be removed completely because remnant caries is a risk to pulp vitality	39 (26.7)	16 (11)	0.418
D) The carious dentin close to the pulp should not be removed to avoid pulp exposure	64 (43.8)	15 (10.3)	0.055
10) Clinical case – A tooth was restored 6 months ago and now it exhibits a radiolucent area under the restoration in the x-ray. The restoration has no signs of failure and the patient has no pain symptomatology.			
A) The restoration should be replaced	23 (15.8)	10 (6.8)	
B) The restoration should be followed-up	86 (58.9)	27 (18.5)	0.456

*****Statistically significant difference. §, Fisher's exact test.

There was a statistically significant difference in other parameters; "Deep carious dentin removal: I remove all dentin, if pulp exposure occur, I perform direct pulp capping", totally disagree n=13 vs. totally agree n=19 (p=0.009) and, "I perform excavation and some dentin is left. Later, I perform total removal (two steps)", 17 vs. 79 (p=0.027); "How do you fell about leaving carious tissue under a restoration? Caries should always be removed completely because remnant caries is a risk to pulp vitality" 20 vs. 35 (p=0004), and "The carious dentin close to the pulp should not be removed to avoid pulp exposure" 10 vs. 69 (p=0.001) (Table 2).

Table 2 – Questionnaire's responses relative to the response for question 11/item B (Pearson's chi square test and Fisher's exact test).

11 B) I prefer the less invasive treatment and accept possible retreatment	**Totally disagree** n (%)	**Totally agree** n (%)	***P***
1) Gender			
Female	25 (17.1)	94 (64.4)	
Male	9 (6.2)	18 (12.3)	0.171
2) Age group			
18 – 29	28 (19.2)	97 (66.4)	
30 or +	6 (4.1)	15 (10.3)	0.536
3) Academic titles			
Undergraduates	14 (9.6)	56 (38.4)	
Dentists	20 (13.7)	56 (38.4)	0.367
4) Carious tissue removal: clinical criteria			
A) Consistency			
1.Soft dentin on the cavity floor	9 (6.2)	30 (20.5)	0.971
2.Leathery dentin on the cavity floor	8 (5.5)	46 (31.5)	0.063
3.Firm dentin on the cavity floor (resistant to cut)	15 (10.3)	35 (24)	0.166
4. Consistency is not important to evaluate carious tissue removal	2 (1.4)	1 (0.7)	0.072§
B) Color			
1.Slightly darkened dentin	6 (4.1)	39 (26.7)	0.057
2. Very darkened dentin	6 (4.1)	26 (17.8)	0.492
3.Dentin with healthy color (yellowish)	12 (8.2)	25 (17.1)	0.128
4. The color is not important to evaluate carious tissue removal	10 (6.8)	22 (15.1)	0.228
C) Moist			
1.Very moist pulp wall	1 (0.7)	6 (4.1)	0.564§
2.Slightly moist pulp wall	10 (6.8)	34 (23.3)	0.916
3.Dry pulp wall	12 (8.2)	42 (28.8)	0.815
4.Moist is not important to evaluate carious tissue removal	11 (7.5)	30 (20.5)	0.527
5) Excavation method			
Round low-speed burs	21 (14.4)	59 (40.4)	0.351
Hand excavators	13 (8.9)	53 (36.3)	
6) Deep carious dentin removal			
A) I remove all dentin, if pulp exposure occur, I perform direct pulp capping	13 (8.9)	19 (13)	**0.009***
B) I remove all dentin, if pulp exposure occur, I perform the endodontic treatment	0 (0)	1 (0.7)	0.580§
C) I perform excavation and some dentin is left. Later, I perform total removal (two steps)	17 (11.6)	79 (54.1)	**0.027***
D) I perform excavation and some dentin is left. I remove all caries of the lateral walls and perform definitive restoration	4 (2.7)	13 (8.9)	0.98§
7) Use of pulp liners			
A) Calcium hydroxide cement	27 (18.5)	81 (55.5)	0.409
B) Glass ionomer cement (Vitrebond®)	6 (4.1)	29 (19.9)	0.324
C) Adhesive system	1 (0.7)	1 (0.7)	0.368§
D) Other liner	0 (0)	1 (0.7)	0.580§

Table 2 – Questionnaire's responses relative to the response for question 11/item B (Pearson's chi square test and Fisher's exact test).

11 B) I prefer the less invasive treatment and accept possible retreatment	**Totally disagree** n (%)	**Totally agree** n (%)	***P***
8) You would expect a two-year survival for which of the following options:			
A) Indirect pulp capping	25 (17.1)	87 (59.6)	0.616
B) Incomplete excavation (selective carious tissue removal)	10 (6.8)	39 (26.7)	0.558
C) Direct pulp capping	22 (15.1)	69 (47.3)	0.744
D) Endodontic treatment	22 (15.1)	90 (61.6)	0.059
9) How do you fell about leaving carious tissue under a restoration?			
A) Caries microorganisms have to be removed completely, otherwise caries may progress	15 (10.3)	31 (21.2)	0.071
B) Caries microorganisms do not have to be removed completely because the restoration will provide the hermetic sealing and no lesion progression will occur	22 (15.1)	83 (56.8)	0.285
C) Caries should always be removed completely because remnant caries is a risk to pulp vitality	20 (13.7)	35 (24)	**0.004***
D) The carious dentin close to the pulp should not be removed to avoid pulp exposure	10 (6.8)	69 (47.3)	**0.001***
10) Clinical case – A tooth was restored 6 months ago and now it exhibits a radiolucent area under the restoration in the x-ray. The restoration has no signs of failure and the patient has no pain symptomatology.			
A) The restoration should be replaced	12 (8.2)	21 (14.4)	
B) The restoration should be followed-up	22 (15.1)	91 (62.3)	**0.043***

*****Statistically significant difference. §, Fisher's exact test.

The logistic regression analysis showed statistically significant differences. The participants who considered pulp wall very moist had approximately eight times more likelihood to choose an invasive treatment (p=0.028). Those who chose endodontic treatment as an option for two-year survival had three times more likelihood to choose an invasive treatment (p=0.032) (Table 3, 11A). Those who affirmed that the carious dentin close to the pulp should not be removed to avoid pulp exposure had almost three times more likelihood to choose minimally invasive treatments (p=0.031) (Table 3, 11B).

Table 3 – Logistic regression analysis (question 11A and 11B) - B, standard error (SE), Wald test (Wald), p-values and odds ratio (OR)

11A) I prefer a more invasive treatment if this increase the longevity of my restorations	**B**	**SE**	**Wald**	***P***	**OR**
1) Gender Female Male	0.954	0.499	3.647	0.056	2.595
4) Carious tissue removal: clinical criteria A) Consistency 1.Soft dentin on the cavity floor	0.893	0.539	2.744	0.098	2.442
4) Carious tissue removal: clinical criteria A) Consistency 2.Leathery dentin on the cavity floor	0.150	0.579	0.067	0.796	1.162
4) Carious tissue removal: clinical criteria C) Moist 1.Very moist pulp wall	2.053	0.936	4.805	**0.028***	**7.788**
6) Deep carious dentin removal A) I remove all dentin, if pulp exposure occur I perform direct pulp capping	0.928	0.496	3.504	0.061	2.528
8) You would expect a two-year survival for which of the following options: D) Endodontic treatment	1.026	0.480	4.577	**0.032***	**2.791**
Constant	-2.270	0.513	19.602	0.000	0.103
11 B) I prefer the less invasive treatment and accept possible retreatment 4) Carious tissue removal: clinical criteria A) Consistency 1.Soft dentin on the cavity floor	0.501	0.825	0.369	0.544	1.650
4) Carious tissue removal: clinical criteria C) Moist 1.Very moist pulp wall	0.831	0.686	1.467	0.226	2.295
9) How do you fell about leaving carious tissue under a restoration? C) Caries should always be removed completely because remnant caries is a risk to pulp vitality	-0.743	0.468	2.524	0.112	0.476
9) How do you fell about leaving carious tissue under a restoration? D) The carious dentin close to the pulp should not be removed to avoid pulp exposure	1.097	0.508	4.660	**0.031***	**2.995**
10) Clinical case – A tooth was restored 6 months ago and now it exhibits a radiolucent area under the restoration in the x-ray. The restoration has no signs of failure and the patient has no pain symptomatology. A) The restoration should be replaced	0.887	0.470	3.557	0.059	2.428
Constant	-0.266	0.830	0.102	0.749	0.767

*****Statistically significant difference.

DISCUSSION

This study evaluated 146 participants regarding diagnosis, therapeutic methods, attitudes, and behaviors towards carious tissue removal of deep lesions and two points raise attention: the participants who considered the pulp wall moist during excavation had eight times more likelihood to perform invasive treatments, while those who agreed that the carious tissue close to the pulp should not be removed had three times more likelihood to perform minimally invasive treatments. Thus, the study participants were divided into those favorable to more and those favorable to less invasive techniques.

In this study, 69 participants chose 2-step carious tissue removal. This approach is disadvantageous because cavity reopening to remove the carious tissue remnant increases the risk to pulp exposure, favoring overtreatment[8,20]. Currently literature supports SCTR by leaving soft dentin and performing definitive restoration of the tooth[21-24].

In this study, the clinical criteria included the dentin consistency: soft or leathery. Coherently, the participants who considered the dentin consistency during the removal did not agree with more invasive approaches. These criterion meets the consensus recommendations on terminology, published in 2016 that states SCTR is the excavation to soft dentin (ultra conservative removal) and firm (leathery) dentin (incomplete removal)[1]. Such principles consider the tactile resistance to the hand excavator and favors the maintenance of the tooth structure[3].

In the non-selective carious tissue removal of hard dentin (complete carious tissue removal), all demineralized dentin is removed, only hard dentin is left of all dental cavity[25]. Selective carious tissue removal is divided into firm and soft dentin patterns. Selective removal of the firm dentin is recommended for carious lesions in shallow or moderate dentin with no chance of pulpal exposure (i.e., ⅓ or ¼ of dentin on radiographic examination). In this clinical procedure, the total removal of the carious tissue in the lateral walls is carried out until the capture of hard dentin, while in the pulp wall, selective removal is carried out until the capture of firm dentin. Selective removal of softened dentin has been indicated for deep carious lesions in dentin. In this clinical procedure, the total removal of the carious tissue from the lateral walls is also performed, while in the pulpal wall, selective removal is performed until the softened dentin is due to the risk of pulpal exposure[26].

The study results showed the limited knowledge on SCTR. The participants tended to be equally more or less invasive. Such finding agrees with the literature in which most of 123 dentists (50.4%) did not perform less invasive approaches and of those who did perform, most (48.8%) believed that minimally invasive approaches were provisional and less effective[20]. Also, some characteristics as clinical practice time period and working place plays a role in the decision to perform more or less invasive treatments[27].

At an umbrella systematic review, there is insufficient evidence to state which technique or medication is ideal to pulp vital treatment in primary teeth in deep cavities. Nevertheless, indirect pulpal treatment has been considered the most effective technique to be applied in deep cavities. There is no evidence regarding individual features, teeth and outcomes of different techniques applied[28]. In randomized clinical trials, no materials for indirect pulp protection showed superiority in the pulp vitality outcome[29].

Selective carious tissue removal showed a success in maintaining the pulpal tissue vital compared with stepwise removal and non-selective carious tissue removal. Outcomes as microbiological evaluation, quality of filling and dentin repair presented similar outcomes. However, a major presence of pulpal exposition in the stepwise removal and non-selective carious tissue removal were observed. Therefore, a SCRT should be performed whereas it is a minimal invasive procedure and is executed in one step[30].

The literature lacks well-defined carious tissue excavation criteria[2]. Studies with questionnaires can be useful tools to detect whether the dentists are following the most current evidences to treat deep carious lesions[4]. However, caution is necessary to interpret data of questionnaires because of high complexity of the factors influencing on the dentists' clinical decisions[31]. To minimize such bias, we used a validated and published questionnaire that described the characteristics of the treatments in each question, aiming at the study objectivity and reliability.

The literature supports the paradigm shifting towards less invasive approaches for deep carious lesions without pulp involvement aiming at tooth structure preservation[12]. However, even with the advances in the researches on caries onset and progression, more invasive treatments are currently practiced[20]. Thus, the dentists should be aware of the most recent scientific evidence available on minimally invasive treatment philosophy[12]. Based on the results of this study, we recommend efforts

encouraging undergraduates, post-graduate students, and dentists to perform minimally invasive treatments as SCTR. We emphasize that the participants had certain level of knowledge on SCTR, but the technique acceptability lacked consensus.

CONCLUSION

In conclusion, the participants had certain level of knowledge on SCTR, but the technique acceptability lacked consensus, about deep carious dentin removal, color, moist, consistency, and the feeling about leaving carious tissue under restauration.

CONFLICT OF INTEREST

The authors declare that they have no conflict of interest.

FINANCIAL SUPPORT AND PROCESS NUMBER

Coordenação de Aperfeiçoamento de Pessoal de Nível Superior – Brasil (CAPES) – Finance Code 001.

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