

# Diş Hekimliği Öğrencilerinin Rubber Dam Kullanımının Değerlendirilmesi

## Evaluation of the Rubber Dam Use of Dentistry Students

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### ÖZ

**Amaç:** Diş hekimliğinde izolasyon yöntemleri arasında rubber dam kullanımı altın standarttır. Bu çalışmanın amacı diş hekimliğinde rubber dam kullanımına öğrencilerin yaklaşımını ve bilgi düzeyini değerlendirmektir.

**Gereç ve Yöntem:** Bu çalışmada Google üzerinden online form oluşturucu yardımıyla anket oluşturuldu. Ankette rubber dam kullanımı ile ilgili çoktan seçmeli ve onay kutucukları şeklinde 18 farklı soru soruldu. Ankette kullanılan sorular literatürde konuyla ilgili sorulmuş sorulardan derlenerek hazırlandı. Anket soruları online olarak 286 kişiye gönderildi. Ankete 262 öğrenci katıldı.

**Bulgular:** Çalışmaya katılanların %43'ü erkek, %57'si kadındı. Katılımcıların yaşları 20-44 arasındadır. Katılımcıların %64'ü rubber dam kullanımını bilmediğini belirtmiş, %97'si ise klinik rutinde rubber dam kullanmadığını bildirmiştir. Yetişkin hastalar için %82, çocuk hastalar için %85'lik kısımlar hiçbir zaman rubber dam kullanmadığını bildirmiştir. Buna rağmen katılımcıların %84'ü vital endodontik tedavilerde, %71'i non-vital endodontik tedavilerde rubber dam kullanımının zorunlu olması gerektiğini düşünmektedir. Katılımcıların büyük çoğunluğu izolasyonu başarıyla ve aspirasyon güvenliği açısından rubber damı faydalı bulmaktadır. Verilen cevaplarda en sık rubber dam kullanmama sebebi olarak bilgi ve eğitim eksikliğini seçilmiştir. Bu sebeple katılımcıların %96'sı kendini rubber dam kullanımında yeterli görmemektedir.

**Sonuç:** Rubber dam kullanımının hekime klinikte sayısız faydası bulunmaktadır. Bu sebeple rubber dam kullanımının yaygınlaşması için gerekli teorik ve pratik eğitimler desteklenmelidir.

**Anahtar Kelimeler:** İzolasyon, Rubber dam, Anket

### ABSTRACT

**Aim:** The use of rubber dam is the gold standard among isolation methods in dentistry. This study aims to evaluate the students' approach and knowledge level on the use of rubber dam in dentistry.

**Materials and Methods:** In this study, a questionnaire was created with the help of an online form builder on Google. In the survey, 18 different questions were asked in the form of multiple choice and check boxes about the use of rubber dam. The questions used in the survey were prepared by compiling the questions asked in the literature. Survey questions were sent to 286 people online. A total of 262 students participated in the survey.

**Results:** Participants were %43 males and 57% females. The ages of the participants are between 20-44. Of the participants, 64% stated that they did not know how to use a rubber dam, and 97% reported that they did not use a rubber dam in their clinical routine. While the rate of those who never used a rubber dam was 82% in adult patients, it was 85% in pediatric patients. Despite this, 84% of the participants think that the use of rubber dam should be mandatory in vital endodontic treatments and 71% in non-vital endodontic treatments. Most of the participants find the rubber dam useful in terms of isolation success and aspiration safety. In the answers given, the lack of knowledge and education was chosen as the most common reason for not using a rubber dam. For this reason, 96% of the participants do not consider themselves sufficient in the use of rubber dam.

**Conclusion:** The use of rubber dam has numerous clinical benefits for the physician. For this reason, necessary theoretical and practical training should be supported for the widespread use of rubber dams.

**Keywords:** Isolation, Rubber dam, Survey

### INTRODUCTION

One of the most important stages in the success of dentistry is isolation.<sup>1</sup> Although cotton rolls, retraction cords, and suction for saliva are used to provide good isolation, the use of a rubber dam provides the most ideal isolation.<sup>2</sup> The European Society of Endodontics (ESE) has made a statement regarding the mandatory application of rubber dam isolation.<sup>3</sup> The American Academy of Endodontists (AAE) has reported that the use of a rubber dam is standard and an integral part of non-surgical endodontics.<sup>4</sup>

Especially after the covid-19 pandemic, which is transmitted and spread by aerosol, the use of rubber dam has gained more importance. With the use of a rubber dam, the particles in the air can be reduced by 70% in an average area of one meter.<sup>5</sup> Today, the use of rubber dam, which has almost no disadvantages, is increasing day by day with its numerous advantages. This study aims to increase the awareness of 4th and 5th-grade dentistry students, whose clinical training has begun, by evaluating the perspective of rubber dam isolation.

### MATERIAL and METHODS

Ethical clearance was obtained before the start of the study from the faculty ethics committee (28.12.2022/50). In this study, a questionnaire was created with the help of an online form builder on Google. In the questionnaire, 18 different questions were asked in the form of multiple choice and checkboxes. The questionnaire consists of questions about demographic data and rubber dam use. The questions used in the survey were prepared by compiling the questions asked in the literature.

- Do you know how to use Rubber Dam?
- Do you use Rubber Dam in clinical practice?
- How often do you use Rubber Dam on adult patients?
- How often do you use Rubber Dam on pediatric patients?
- Where did you learn about Rubber Dam?
- Do you think that the use of Rubber Dam should be mandatory before starting vital endodontic treatments?
- Do you think that the use of Rubber Dam should be mandatory before starting non-vital endodontic treatments?

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- Do you want to use the Rubber Dam when multiple radiographs are required?
- When should a Rubber Dam be placed on primary teeth?
- Do you consider yourself competent in the application of Rubber Dam?
- Would you consider training on the application of Rubber Dam?
- In which restorative treatments should Rubber Dam be used? (You can choose more than one option)
- Which teeth should the rubber dam be used on? (You can choose more than one option)
- What are the benefits of using Rubber Dam? (You can choose more than one option)
- What could be the reasons for not using Rubber Dam? (You can choose more than one option)

Questionnaires were sent online to 286 people in total who were receiving clinical training at Selcuk University Faculty of Dentistry. 24 people refused to participate in the survey. For this reason, 262 people, consisting of 4th and 5th-grade students who participated in the survey, were included in the study.

Obtained survey data were analyzed using SPSS version 29.0 (SPSS, Chicago, IL, USA). Frequency analysis and the Chi-square test were used statistically. The statistical significance level was accepted as  $p < 0.05$ .

**RESULTS**

There are 113 male and 149 female participants in the study. 117 of these participants (45%) are 5th-grade students and 145 (55%) are 4th-grade students. The ages of the participants vary between 20 and 44 (Table 1).

When asked if they know how to use a rubber dam, 64% of the participants answered no. Of those who answered yes, 19% were 4th-grade students and 17% were 5th-grade students. There was no statistical difference between classes 4 and 5 in terms of knowing the use of rubber dam.

**Table 1. Distribution of respondents**

	Gender	Male		Female		Total	
		N	Percent (%)	N	Percent (%)	N	Percent (%)
		5th grade	55	%47,0	62	%53,0	117
4th grade	58	%40,0	87	%60,0	145	%55,3	
Total	113	%43,1	149	%56,9	262	%100	

Only 7 participants stated that they used a rubber dam in clinical practice. It was not found statistically significant for the use of rubber dam in clinical practice for grade 4 and 5 students. However, a significant difference was found between males and females in terms of the use of rubber dam in clinical practice ( $p=0.045 < 0.05$ ) (Table 7). According to this result, males use more rubber dam in clinical practice.

82% of the participants reported that they had never used a rubber dam in adult patients. There was no statistically significant relationship between rubber dam use in adult patients between both genders and classes.

Regarding the use of RD in pediatric patients, 85% of the participants reported that they had never used RD. The use of rubber dam in pediatric patients was evaluated statistically by chi-square test according to both gender ( $p=0.038 < 0.05$ ) and grade ( $p=0.034 < 0.05$ ). In both comparisons, the difference between the groups was significant (Table 2,6,7). Here again, males usually wear more rubber dams.

**Table 2. How often do you use Rubber Dam on pediatric patients?**

	Never	Sametimes	Always	Total
	% (n)	% (n)	% (n)	% (n)
Male	%86 (97) <sup>a</sup>	%11 (12) <sup>a</sup>	%3 (4) <sup>b</sup>	%100 (113)
Female	%85 (126) <sup>a</sup>	%15 (23) <sup>a</sup>	%0 (0) <sup>b</sup>	%100 (149)
4th grade	%81 (117) <sup>a</sup>	%16 (24) <sup>a</sup>	%3 (4) <sup>a</sup>	%100 (145)
5th grade	%91 (106) <sup>b</sup>	%9 (11) <sup>a</sup>	%0 (0) <sup>a</sup>	%100 (117)

The rate of those who received rubber dam education from dentistry faculties is 67%. The remaining 33% reported that they learned rubber dam from different fields such as private course, the internet, and colleagues. In Selcuk University, Faculty of Dentistry, 4th and 5th-grade students mostly received rubber dam education from the faculty of dentistry. The relationship between the participants' classes and rubber dam learning was statistically significant ( $p=0.011 < 0.05$ ) (Table 3.7). Accordingly, 4th-grade students learned the rubber dam application from the faculty compared to 5th-grade students, while the majority of 5th-grade students learned from different places.

**Table 3. Where did you learn about Rubber Dam?**

	Faculty of Dentistry	Other	Total
	% (n)	% (n)	% (n)
4th grade	%74 (107)	%26 (38)	%100 (145)
5th grade	%59 (69)	%41 (48)	%100 (117)
Total	%67 (176)	%33 (86)	%100 (262)

Participants reported that the use of rubber dam should be mandatory at a rate of 84% in vital endodontic treatments and 71% in non-vital endodontic treatments. The relationship between grades and the mandatory rubber dam in vital endodontic treatments was found to be statistically significant ( $p=0.047 < 0.05$ ) (Table 4.7). In this case, 5th-grade students support the rubber dam requirement more than 4th-grade students in vital endodontic treatments.

**Table 4. Do you think that the use of Rubber Dam should be mandatory before starting vital endodontic treatments?**

	Yes	No	Total
	% (n)	% (n)	% (n)
4th grade	%80 (116)	%20 (29)	%100 (145)
5th grade	%90 (105)	%10 (12)	%100 (117)
Total	%84 (221)	%16 (41)	%100 (262)

When more radiographs are required, 26% of the participants consider the use of a rubber dam. Difficulties that may occur during radiography have led to less use of rubber dams. However, this difference was not statistically significant when compared between genders and grades.

When asked about the use of a rubber dam in primary teeth, 80% of the participants answered never. This result was also statistically insignificant between grades and gender.

The rate of those who consider themselves inadequate in the rubber dam application was found to be 96%. 91% of males and 99% of females find themselves inadequate. At the same time, 99% of 4th-grade students and 92% of 5th-grade students find themselves inadequate. When statistically evaluated, the relationship between gender and those who found themselves insufficient in rubber dam was found to be statistically significant. At the same time, the relationship between those who find themselves inadequate and their grade students were found to be statistically significant (Table 5,6,7). As a result, males compared to females and 5th-grade students compared to 4th-grade students consider themselves more competent in rubber dam use than others.

**Table 5. Do you consider yourself competent in the application of Rubber Dam?**

	Yes	No	Total
	% (n)	% (n)	% (n)
Male	%9 (10)	%91 (103)	%100 (113)
Female	%1 (1)	%99 (148)	%100 (149)
4th grade	%1 (2)	%99 (143)	%100 (145)
5th grade	%8 (9)	%92 (108)	%100 (117)

**Table 6. Chi-square analyzes of the relationship of all answers with gender**

Gender (Female-Male)	Chi-square	P value
Do you know how to use Rubber Dam?	1,092	0,296
Do you use Rubber Dam in clinical practice?	5,317	0,045
How often do you use Rubber Dam on adult patients?	3,634	0,157
How often do you use Rubber Dam on pediatric patients	5,996	0,038
Where did you learn about Rubber Dam?	3,368	0,066
Do you think that the use of Rubber Dam should be mandatory before starting vital endodontic treatments?	1,297	0,255
Do you think that the use of Rubber Dam should be mandatory before starting non-vital endodontic treatments?	1,649	0,199
Do you want to use the Rubber Dam when multiple radiographs are required?	0,403	0,526
When should a Rubber Dam be placed on primary teeth?	1,479	0,86
Do you consider yourself competent in the application of Rubber Dam?	10,687	0,001
Would you consider training on the application of Rubber Dam?	2,528	0,112

Of the participants participating in the study, 93% (243) reported that they were considering taking rubber dam training. This high rate indicates that more attention should be paid to the rubber dam.

**Table 7. Chi-square analyzes of the relationship of all answers with the grade**

Grade (4th Grade-5th Grade)	Chi-square	P value
Do you know how to use Rubber Dam?	0,166	0,684
Do you use Rubber Dam in clinical practice?	2,684	0,135
How often do you use Rubber Dam on adult patients?	2,072	0,41
How often do you use Rubber Dam on pediatric patients	6,099	0,034
Where did you learn about Rubber Dam?	6,449	0,011
Do you think that the use of Rubber Dam should be mandatory before starting vital endodontic treatments?	3,948	0,047
Do you think that the use of Rubber Dam should be mandatory before starting non-vital endodontic treatments?	1,525	0,217
Do you want to use the Rubber Dam when multiple radiographs are required?	0,003	0,958
When should a Rubber Dam be placed on primary teeth?	2,706	0,468
Do you consider yourself competent in the application of Rubber Dam?	6,416	0,014
Would you consider training on the application of Rubber Dam?	0,933	0,334

The question of which restorative procedures should be used for rubber dam was asked in the form of checkboxes. Composite restorations were the most marked option with a rate of 49% (211) (Figure 1).

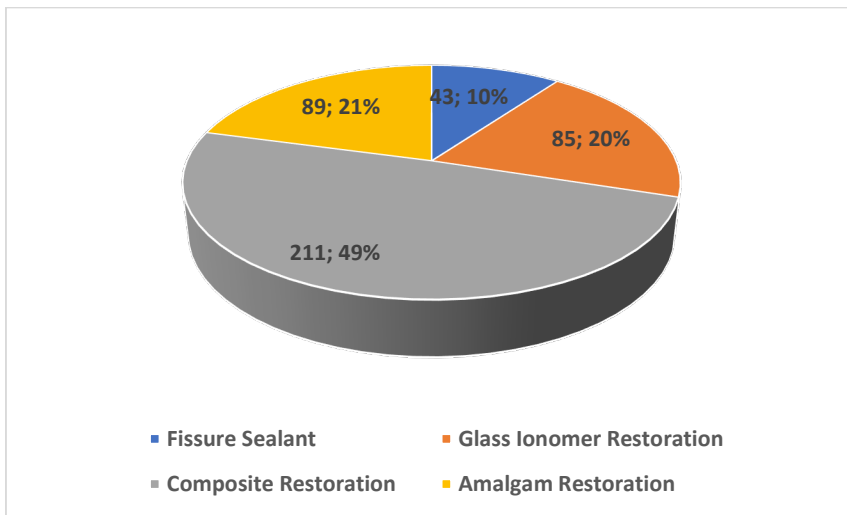


Figure 1. In which restorative treatments should Rubber Dam be used?

In the question of which teeth should be used rubber dam, the molar teeth option was the most selected option, but 45% (168) of the participants also selected all teeth (Figure 2).

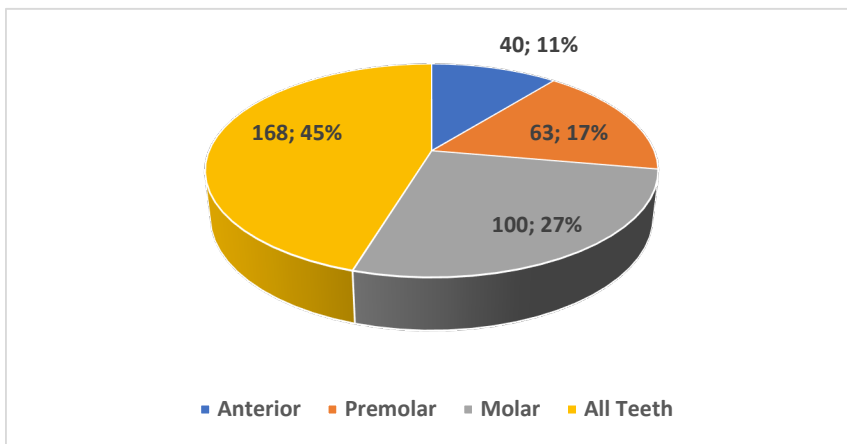


Figure 2. Which teeth should rubber dam be used on?

The most marked options in the question of what are the benefits of using Rubber Dam were patient safety against aspiration (22%=223), providing improved isolation (24%=243), reducing microbial contamination (22%=220) (Figure 3).

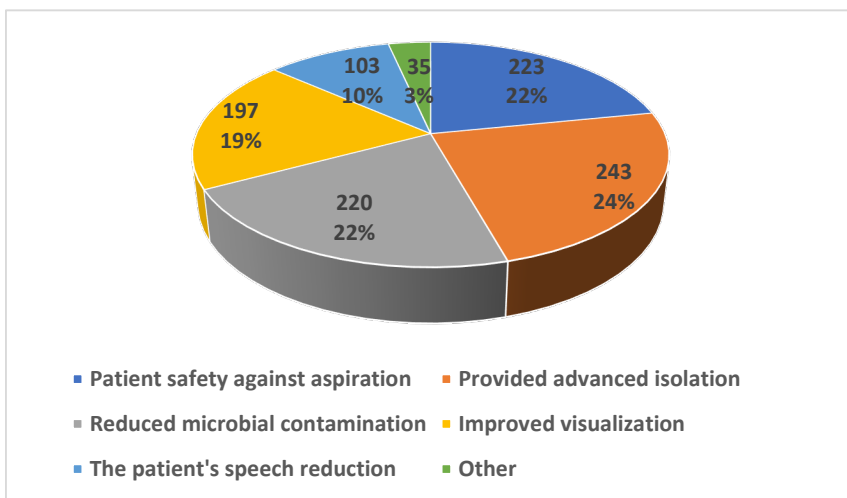
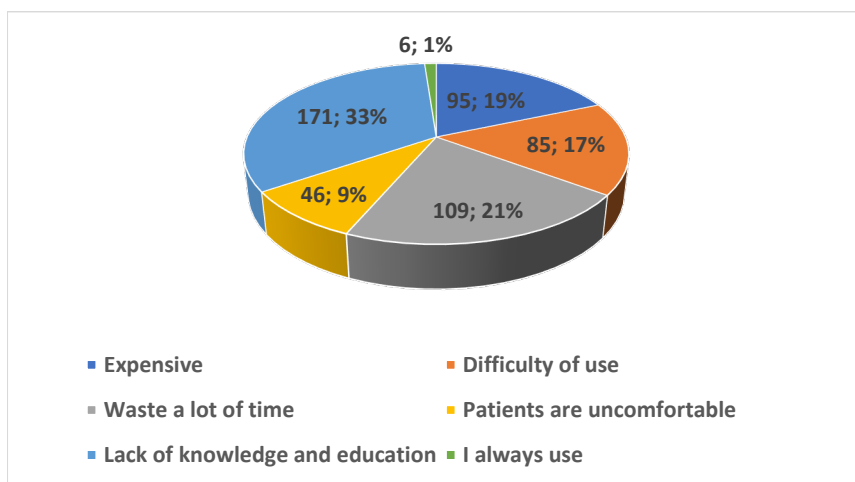


Figure 3. What are the benefits of using Rubber Dam?

What could be the reasons for not using Rubber Dam? In the question, a maximum of 33% (171) lack of knowledge and education option was marked. The second most frequently marked response was time-consuming (21%) (Figure 4).



**Figure 4.** What could be the reasons for not using Rubber Dam?

## DISCUSSION

The use of RD in today's dentistry is increasing day by day. The use of rubber dam is the gold standard, especially in pulpal treatments.<sup>6</sup> However, for various reasons, the use of rubber dams at ideal levels has not become widespread. Recently, with the effect of social media, the use of rubber dam has become more widespread, and thus, many studies have been carried out emphasizing its importance. In addition, after the covid-19 pandemic transmitted by aerosol, dental treatments started to be planned under many measures that reduce aerosol and prevent microbial contamination. In particular, the density of bacterial microorganisms in the air decreases with the use of RD. Therefore, the interest in the use of RD has increased even more.<sup>7, 8</sup> The use of RD in isolation dates back to ancient times. In a journal on this subject in 1962, it was emphasized that although the rubber dam was universally accepted by many authorities, it was also ignored by many dentists<sup>9</sup> The results of this study are generally similar to previous studies. Although its use is generally known, its application in practice has been found insufficient. Especially when students are at the beginning of the road, they need to give more importance to this subject and improve themselves.

Many studies are comparing the frequency of rubber dam use in clinical practice in various groups.<sup>10-12</sup> In many studies, the use of rubber dam in clinical routine remained at low rates.<sup>13,14</sup> In line with the literature, the results of this study were low in terms of RD use. In the studies, reasons such as insufficient education, the unwillingness of patients, difficult use, wasting time, and high cost were reported as reasons for not using RD.<sup>15,16</sup> In this study, the most common reasons for not using RD were reported as lack of knowledge and education and taking too much time. The reason for this situation may be that the participants are still students and they are slow in application because they are still in the learning phase.

One study compared the use of a rubber dam in primary and permanent teeth. According to the study, the use of rubber dam in primary teeth was found to be significantly lower than in permanent teeth.<sup>11</sup> According to the results of this study, the rate of use of rubber dam in both adult and pediatric patients was found to be very low. Although there was no significant difference, the use of rubber dam in primary teeth was lower in line with the literature.

Many clinical studies have demonstrated the benefits of using RD.<sup>4,17</sup> At the same time, there are studies in the literature that have experienced many complications that may occur when RD is not used.<sup>18-21</sup> Therefore, the use of RD is very valuable in terms of patient safety. In this study, patient safety, isolation, and prevention of microbial contamination were chosen as the most common reasons for using RD. In the light of these results, similar results have emerged with the previous literature.<sup>11</sup>

In studies conducted with students, although most students advocate the use of RD in many areas, the frequency of RD use among graduate practitioners is low.<sup>14,16</sup> In this case, it can be concluded that what is generally known theoretically is not always applied in practical education. In this study, a very high consensus was found that the use of RD in vital and nonvital endodontic treatments should be mandatory. Perhaps very few of the students participating in this study will consider the routine use of RD in endodontic treatments in the future.

## CONCLUSION

Many studies and researches reveal that RD isolation is a non-negligible method for dentistry. In the literature, both AAE and ESE strongly recommend the use of RD. In terms of both treatment success and patient safety, the use of RD should be given the value and dedication it deserves. Especially in educational institutions such as universities, this subject should be focused on theoretically and practically.

## Etik Beyan / Ethical statement

Bu çalışma Selçuk Üniversitesi 3. Uluslararası Yenilikçi Diş Hekimliği Kongresi'nde (25-27 Kasım 2022, Konya, Türkiye) sözlü bildiri olarak sunuldu.

Çalışma herhangi bir tez çalışması değildir.

Bu çalışmanın hazırlanma sürecinde bilimsel ve etik ilkelere uyulduğu ve yararlanılan tüm çalışmaların kaynakçada belirtildiği beyan olunur.

This study was presented as an oral presentation at Selcuk University 3rd International Congress of Innovative Dentistry (25-27 November 2022, Konya, Turkey).

The study is not any thesis work.

It is declared that during the preparation process of this study, scientific and ethical principles were followed and all the studies benefited are stated in the bibliography.

**Değerlendirme / Peer-Review**

İki Dış Hakem / Çift Taraflı Körleme

**Etik Beyan / Ethical statement**

Bu çalışma Selçuk Üniversitesi 3. Uluslararası Yenilikçi Diş Hekimliği Kongresi'nde (25-27 Kasım 2022, Konya, Türkiye) sözlü bildiri olarak sunuldu.

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**Benzerlik Taraması / Similarity scan**

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**Çıkar Çatışması / Conflict of Interest**

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