Cumhuriyet Dental Journal, 28(2): 192-198, 2025
DOI: https://doi.org/10.7126/cumudj.1618225

Cumhuriyet Dental Journal

| cdj.cumhuriyet.edu.tr | Founded: 1998 Available online, ISSN: 1302-5805 Publisher: Sivas Cumhuriyet Üniversitesi

Evaluation of Parents' Knowledge Levels and Awareness Regarding Emergency Management of Tooth Avulsion: An Institutional Cross-Sectional Study

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Research Article

History

Received: 12/01/2025
Accepted: 14/04/2025

ABSTRACT

Objectives: The purpose of this study was to evaluate parental awareness and knowledge regarding the management of tooth avulsion.

Materials and Methods: This study was designed as a cross-sectional survey. 250 parents who had applied to the Department of Pediatric Dentistry at Sivas Cumhuriyet University Faculty of Dentistry were included. A self-administered survey consisting of 19 items in 3 section was used to assess the awareness and knowledge level of parents regarding emergency management of tooth avulsion. Non-parametric data were analyzed using the Mann-Whitney U and Kruskal-Wallis tests.

Results: Of the parents who participated in the study, 52% were in their thirties, 59.6% were female and 28.8% were university graduates. 91.6% of the parents had received no training on dental injuries. While 84% of the parents stated that they would not be able to reimplant the avulsed tooth, 10.4% stated that they would store the avulsed tooth in milk. Only 37.2% of parents were aware of the proper treatment of an avulsed primary tooth. There was no statistically significant difference between parents' knowledge level regarding tooth avulsion and age and gender (p=0.189, p=0.553), while a significant difference was found between educational level (p<0.001). The mean total score of the correct responses regarding emergency management of avulsed teeth was 4.54±1.97 and the percentage of correct responses was 45.4%.

Conclusions: This study revealed that parents do not have sufficient knowledge about the emergency management of tooth avulsion and that university graduates have higher knowledge than primary and high school graduates. Therefore, educational programs should be organized in accordance with the educational level of parents on emergency treatment management of tooth avulsion.

Keywords: Tooth Avulsion, Dental trauma, Knowledge level, Parents

Ebeveynlerin Diş Avülsiyonunun Acil Tedavisine İlişkin Bilgi Düzeylerinin ve Farkındalıklarının Değerlendirilmesi: Kurumsal Bir Kesitsel Çalışma

Araştırma Makalesi

Süreç

Geliş: 12/01/2025
Kabul: 14/04/2025

ÖZET

Amaç: Bu çalışmanın amacı diş avülsiyonunun yönetimine ilişkin ebeveyn farkındalığını ve bilgisini değerlendirmektir.

Gereç ve Yöntemler: Bu çalışma kesitsel bir anket olarak tasarlanmıştır. Sivas Cumhuriyet Üniversitesi Diş Hekimliği Fakültesi Çocuk Diş Hekimliği Anabilim Dalı'na başvuran 250 ebeveyn çalışmaya dahil edilmiştir. Ebeveynlerin diş avülsiyonun acil yönetimi ile ilgili farkındalık ve bilgi düzeyini değerlendirmek için 19 soru ve 3 bölümden oluşan kendi kendine uygulanan bir anket kullanılmıştır. Parametrik olmayan veriler Mann-Whitney U ve Kruskal-Wallis testleri kullanılarak analiz edilmiştir.

Bulgular: Çalışmaya katılan ebeveynlerin %52'si otuzlu yaşlardaydı, %59,6'sı kadındı ve %28,8'i üniversite mezunuydu. Ebeveynlerin %91,6'sı diş yaralanmaları konusunda herhangi bir eğitim almamıştı. Ebeveynlerin %84'ü avülse dişi tekrar implante edemeyeceklerini belirtirken, %10,4'ü avülse dişi süt içinde taşıyacaklarını belirtmiştir. Ebeveynlerin sadece %37,2'si avülse süt dişinin uygun tedavisi hakkında bilgi sahibiydi. Ebeveynlerin diş avülsiyonu hakkındaki bilgi düzeyi ile yaş ve cinsiyet arasında istatistiksel olarak anlamlı bir fark bulunmazken (p=0,189, p=0,553), eğitim durumu ile arasında anlamlı bir fark bulunmuştur (p<0,001). Avülse dişlerin acil yönetimine ilişkin doğru cevapların toplam puan ortalaması 4,54±1,97 ve doğru cevap yüzdesi %45,4'idi.

Sonuç: Bu çalışma, ebeveynlerin diş avülsiyonun acil yönetimi hakkında yeterli bilgiye sahip olmadıklarını ve üniversite mezunlarının ilköğretim ve lise mezunlarına göre daha yüksek bilgiye sahip olduklarını ortaya koymuştur. Bu nedenle, diş avülsiyonunun acil tedavi yönetimi konusunda ebeveynlerin eğitim düzeyine uygun eğitim programları düzenlenmelidir.

Anahtar Kelimeler: Diş avülsiyonu, Dental travma, Bilgi düzeyi, Ebeveynler

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How to Cite: Koçkanat A, Evaluation of Parents' Knowledge Levels and Awareness Regarding Emergency Management of Tooth Avulsion: An Institutional Cross-Sectional Study. *Cumhuriyet Dental Journal, 28(2): 192-198.*

Introduction

Traumatic dental injuries are common oral and dental health problems in children and young adults. Traumatic dental injuries frequently occur due to causes such as falls, collisions, fights and traffic accidents. This can range from simple enamel fracture to complicated injuries involving supporting structures and avulsion of teeth.[1,2]

Avulsion, which is defined as complete removal of the tooth from the alveolar socket as a result of trauma, is a complex form of injury affecting the alveolar bone and periodontal ligaments as well as the pulp.[3] Avulsion constitutes 7-13% of all traumatic dental injuries in primary dentition and 0.5-16% in permanent dentition. Also, it mostly affects maxillary central teeth.[4,5] Avulsion is more common in the 8-12 age group and in males. Early loss of anterior teeth causes negative effects on quality of life, physiological development, loss of aesthetics and function, and psychological trauma.[6-8]

Immediate and appropriate emergency management after tooth avulsion is very important for the prognosis of the affected tooth.[9] Since the time that the avulsed tooth spends outside the socket is critical for preserving periodontal ligament viability, the ideal is to reimplant the tooth into the socket correctly as soon as possible.[10] The prognosis of a reimplanted tooth depends on the time interval between trauma and reimplantation, where and how the tooth is stored, the presence of contamination, the stage of root formation, and the oral and systemic health status of the child.[11,12] Therefore, it is crucial that parents, teachers or lay people who are among the most frequently present when the injury occurs, should be informed about when and how to intervene in this situation.[13,14]

Although there have been many studies evaluating the knowledge and attitudes of parents about avulsed teeth in different countries, studies evaluating the awareness and knowledge level of parents living in Türkiye are limited.[6,15-19] To our knowledge, no similar study has been reported on parents living in Sivas province. Hence, current study aimed to assess parents' awareness and knowledge about emergency management of avulsed tooth in Sivas province, Türkiye.

Materials and Methods

Study Design

The current study was designed as a cross-sectional survey. The participants of the study consisted of the parents of patients who applied to Department of Pediatric Dentistry at Sivas Cumhuriyet University Faculty of Dentistry for routine treatment between 10.06.2024-10.08.2024. Our study was conducted according to the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) protocol.[20]

Ethical Approval

Ethical approval was obtained from Non-Interventional Clinical Research Ethics Committee at Sivas Cumhuriyet University with permission number 2024/05-01. The ethical standards of the Helsinki Declaration were followed.

Sample Size Calculation

The minimum sample size was determined as 250 participants with a 90% confidence interval, 0.05 alpha value and 0.5 medium effect size. 250 parents participated in this study.

Participants

Parents were informed about the purpose and content of the study, and written informed consent was obtained from those who agreed to participate. Parents older than 20 years of age who agreed to participate in the study and responded all the items were included in the study, while illiterate parents who did not agree to participate in the present study, who did not response the items completely, who were younger than 20 years of age, who did not speak Turkish, and who worked in any dentistry-related place (dentists, dental technicians, dental assistants, etc.) were not included in the present study.

Survey Procedure

The self-administered questionnaire form consisting of 3 sections and 19 multiple-choice items was distributed to the parents during their free time in the dental clinic. A structured questionnaire based on similar studies in the literature was used in this study.[6,18,19] Section 1 of the questionnaire consisted of demographic information regarding age, gender and education of the participants. Section 2 of the questionnaire evaluated the parents' past experiences with dental trauma, whether they had received training on dental trauma, the source and adequacy of this training if they had received training, whether they wanted to learn about dental trauma and whether they distinguished primary teeth. Section 3, which evaluated parental awareness and knowledge of tooth avulsion, consisted of 10 items. Parents were asked items about what to do in case of permanent tooth avulsion injury, how to handle the avulsed tooth, how to clean it if it is contaminated, how to store it, how long it takes to reach the dentist, and their awareness about the avulsed primary tooth and tetanus vaccination. Some of the items in this section have more than one correct response. A total knowledge score was calculated by giving 1 point for each correct response. In the questionnaire, participants could score a minimum of 0 points and a maximum of 10 points.

Data Analysis

IBM SPSS Statistics for Windows 23 (SPSS Inc., Chicago, IL, USA) was used for data analysis. Continuous variables are presented as mean, standard deviation, minimum, and maximum values, while categorical variables are presented as frequencies and percentages. Normality distribution was examined with Kolmogorov-Smirnov test. Non-parametric data were analyzed using the Mann-Whitney U and Kruskal-Wallis tests. Post-hoc comparisons were performed using the Mann-Whitney U test with the Bonferroni correction. Statistical significance was set at $p<0.05$.

Results

Demographic information of the parents evaluated in section 1 of the questionnaire is given in Table 1. 59.6% of the parents were female and 40.4% were male. 52% of the participants were between the ages of 31-40 and 30.4% were between the ages of 41-50. 38% of the parents were primary school graduates, 33.2% were high school graduates and 28.8% were university graduates. While there was no significant difference between age and gender and parents' knowledge level about tooth avulsion (p=0.189, p=0.553), a significant difference was observed between educational level (p<0.001).

The responses evaluating the parents' previous dental trauma experiences and awareness are given in Table 2. 91.6% of the parents stated that they did not receive any training about dental trauma and only 4.4% of the parents who received sufficient training. While 39.6% of the parents stated that they wanted to receive training about dental trauma, 34.4% did not want to receive training and 26% were undecided. The knowledge level of parents who wanted to receive training was found to be significantly lower (p<0.001). 34% of the parents stated that their child had experienced dental trauma before and 66% stated that they had no dental trauma experience. While 39.6% of the parents stated that they could distinguish between primary and permanent teeth, 34.4% stated that they could not, 26% stated that they were undecided. A statistically significant difference was observed between the knowledge level of parents who were aware and not aware of primary and permanent teeth about tooth avulsion (p=0.001).

The responses of the parents to the items evaluating the knowledge level regarding tooth avulsion are given in Table 3. When asked what you do in case of avulsion of a permanent tooth, 51.6% of the parents stated that they would find the avulsed tooth and apply to the dentist in an appropriate medium. When asked how you would hold the avulsed tooth, 35.2% of the parents stated that they would hold it by the crown, 13.2% by the root, while 36.8% did not know. When asked how do you handle a avulsed tooth if it is dirty, 34% of the parents stated that they would wrap it in a paper napkin, 23.6% stated that they would hold it in water without rubbing it, and 18% did not know. When asked where do you keep the avulsed tooth while taking it to the dentist, 44.4% of the parents responded in a paper napkin, 10.4% in milk, 8.4% in water. When asked how long it takes to reach the dentist, 38.4% of the parents responded within 1 hour, 22.4% within 20 minutes, and 17.2% within a day. When asked where you would first apply for the treatment of your child, 50.8% stated that they would go to a dental hospital and 29.2% stated that they would go to a faculty of dentistry. When asked whether it is important to lose time in reaching the dentist, 92% of the parents responded yes. When asked whether it is important for your child to have tetanus vaccination, 90.4% of the parents responded yes. When asked if the tooth displaced as a result of trauma is a primary tooth, 37.2% of the parents stated that it is not placed back into its socket in the jawbone, while 56.8% stated that they had no opinion.

The mean correct responses of the items measuring the knowledge level of the parents regarding tooth avulsion was 4.54 ± 1.97 and the percentage of correct responses was 45.4%. The mean correct responses and percentages of parents with different educational levels are given in Table 4. There was a statistically significant difference between the knowledge level regarding tooth avulsion and educational level (p<0.001). Post-hoc comparisons were performed using The Mann-Whitney U test with Bonferroni correction and adjusted p-value was calculated 0.017. Pairwise comparisons showed that university graduates had significantly higher knowledge levels regarding tooth avulsion than both primary and high school graduates (p<0.001). No significant difference was observed between primary and high school graduates in terms of knowledge level about tooth avulsion (p=0.057).

Table 1. *Distribution of demographic information of the participants and the significance between the parents' knowledge level about tooth avulsion*

Demographic information		*n* (%)	*p-value*
Gender	Female	149 (59.6)	0.553
	Male	101 (40.4)	
Age	20-30	30 (12)	0.189
	31-40	130 (52)	
	41-50	76 (30.4)	
	51 and over	14 (5.6)	
Education Level	Primary school	95 (38)	**<0.001**
	High school	83 (33.2)	
	University	72 (28.8)	
Total		250 (100)	

Table 2. *Distribution of participants' responses to items assessing the dental trauma experiences and the significance between the parents' knowledge level about tooth avulsion*

Items	Responses	*n* (%)	*p-value*
Have you received training on dental injuries before?	Yes	21 (8.4)	0.127
	No	229 (91.6)	
If yes, what is the source of the training you received?	First aid course	4 (1.6)	0.879
	Dentist	13 (5.2)	
	Other health workers	2 (0.8)	
	Friend	1 (0.4)	
	Internet	1 (0.4)	
	Other (school etc.)	-	
How would you rate the training you received?	Adequate	11 (4.4)	0.484
	Not enough	6 (2.6)	
	Undecided	4 (1.6)	
Has your child had dental injuries before?	Yes	85 (34)	0.131
	No	165 (66)	
Can you distinguish between primary and permanent teeth?	Yes	99 (39.6)	**0.001**
	No	86 (34.4)	
	Undecided	65 (26)	
Would you like to receive training on dental injuries?	Yes	99 (39.6)	**<0.001**
	No	86 (34.4)	
	Undecided	65 (26)	

Table 3. *Distribution of participants' responses to items regarding emergency management of tooth avulsion*

Items	Responses	*n* (%)
What do you do if your child's front permanent tooth is completely avulsed after a cycling accident?	I don't look for the tooth, I don't go to the dentist, the tooth has already come out.	13 (5.2)
	I go to the dentist without trying to find the avulsed tooth	55 (22)
	I find the displaced tooth and apply to the dentist in a suitable medium	129 (51.6)
	I find the avulsed tooth, wash and replace it if it is contaminated and then consult a dentist.	15 (6)
	I don't know	38 (15.2)
Where would you first contact for the treatment of your child?	Any hospital emergency department	45 (18)
	Private Dental Office	5 (2)
	Dental hospital	127 (50.8)
	Faculty of dentistry	73 (29.2)
How do you hold the avulsed tooth?	From the root	33 (13.2)
	From the surface visible in the mouth	88 (35.2)
	I don't think it's important	37 (14.8)
	I don't know	92 (36.8)
How do you proceed if the avulsed tooth is dirty?	I wrap it in a napkin	85 (34)
	I try to clean it with a toothbrush	28 (11.2)
	I hold it in water without rubbing it	59 (23.6)
	I don't clean	33 (13.2)
	I don't know	45 (18)
Where do you keep the avulsed tooth when you take it to the dentist?	On a paper napkin	111 (44.4)
	In tap water	21 (8.4)
	In milk	26 (10.4)
	In saliva	3 (1.2)
	In saline	19 (7.6)
	Alcohol	7 (2.8)
	I don't think it's important	13 (5.2)
	I don't know	50 (20)
How long does it take to reach the dentist?	In the first 20 minutes	56 (22.4)
	In the first hour	96 (38.4)
	In a few hours	42 (16.8)
	During the day	43 (17.2)
	At any time	8 (3.2)
	I don't know	5 (2)

Do you think it is important to lose time in reaching the dentist?	Yes	230 (92)
	No	20 (8)
Can you replace the avulsed permanent tooth?	Yes	6 (2.4)
	No	210 (84)
	Undecided	34 (13.6)
Do you think it is important for your child to have tetanus vaccination?	Yes	226 (90.4)
	No	24 (9.6)
If your child's avulsed tooth after injury is a primary tooth;	Can be placed back into its socket in the jawbone	15 (6)
	Cannot be placed back into its socket in the jawbone	93 (37.2)
	No opinion	142 (56.8)
Total		250 (100)

Table 4. *Distribution of the number and percentage of correct responses according to education level*

Education Level		Number of correct responses		Percentage of correct responses	*p-value*
	n	Min-max	Mean±SD		
Primary School	95	0-8	3.78±1.81	37.8	**<0.001**
High School	83	0-8	4.40±1.80	44	
University	72	1-9	5.71±1.82	57.1	
Total	250	0-9	4.54±1.97	45.4	

Discussion

Traumatic dental injuries occur most commonly at school or at home.[21] Tooth avulsion is the most critical type of injury and requires immediate and proper emergency management. Correct first intervention with adequate knowledge and awareness of parents is of critical importance in terms of prognosis of trauma and prevention of complications.[22] There are limited number of studies evaluating the knowledge and awareness of parents regarding tooth avulsion management in Türkiye.[6,15-19] There is a need to assess the attitudes and behaviors of parents in different countries and geographical regions at the time of trauma in order to plan educational programs appropriate to their level of education. To our knowledge, there is no study evaluating the knowledge level of parents in Sivas province regarding emergency management of tooth avulsion. The purpose of this study was to evaluate parents' awareness and knowledge regarding the emergency management of tooth avulsions in Sivas province.

According to the results of this study, the mean of the correct responses given by the parents to the items was 4.54±1.97 and the percentage of correct responses was 45.4%. This result is compatible with the study conducted by Güler et al. in Türkiye.[19] In studies conducted in other countries measuring the knowledge level of parents regarding emergency management tooth avulsion, percentage of knowledge level of parents was similarly found to be low.[11,23,24] A significant difference was found between parents' level of knowledge about tooth avulsion and their level of education. Parents who graduated from university were found to have statistically better knowledge level about tooth avulsion than both primary school and high school graduates (p<0.001). No significant difference was found between knowledge level about tooth avulsion gender and age. Similar results to current study were found in studies in the literature.[9,18,19] There was no significant difference between the knowledge level of the parents who received dental trauma training and who encountered any type of dental trauma, but the knowledge level of the parents who had the awareness of distinguishing between primary and permanent teeth was significantly higher (p=0.001). While 39.6% of the parents stated that they could distinguish between primary and permanent teeth, 34.4% stated that they could not distinguish between primary and permanent teeth and 26% stated that they were undecided. Kaul et al.[25] and Hashim[26] reported similar rates to current study in terms of permanent and primary tooth awareness, while Güler et al. reported a slightly higher rate.[19] Only 39.6% of the parents wanted to receive training about dental trauma and the knowledge level of the parents who wanted to receive training about dental trauma was found to be significantly low (p<0.001). The rate of these parents was found to be lower compared to studies in the literature.[6,18,25,26] This may have been due to the fact that parents were not aware that they would play an active role in the emergency management of avulsion injuries or that they did not prioritize participation in the training program among their daily responsibilities.

In section 3 of present study, the parents were asked items evaluating their knowledge level and awareness regarding emergency management of tooth avulsion. The prognosis of an avulsed tooth is determined by the time out of the socket, the transportation medium, the minimal damage to the periodontal ligament cells, and the presence of contamination.[10] Therefore, immediate and proper emergency management of the trauma process by the parents is directly related with the prognosis of the avulsed tooth.[27] The most appropriate treatment for avulsed permanent tooth is immediate reimplantation. According to the results of this study, 51.6% of the parents stated that they would refer the avulsed tooth to the dentist in the appropriate medium, while only 6% stated that they could replace the avulsed tooth. These results are similar to the results of studies conducted with Turkish parents, but slightly lower. In the study of Özer et al.[6], 9.3% of the parents and in the study of Doğusal et al.[28], 7.4% of the parents stated that they could replace the avulsed tooth. These rates are also lower compared to studies

conducted in different countries.[23-25] This may be due to differences in medical educational information between countries and cities. As a result, the lack of knowledge among parents about this important issue is clearly visible in Türkiye.

The appropriate transport medium of a tooth that cannot be immediately reimplanted is an important factor affecting clinical success. Pasteurized milk is considered to be the most suitable transport medium to prevent dehydration of the periodontal ligaments. Milk is compatible with periodontal ligament cells, including appropriate pH and osmolality, and is easy to access in an emergency.[29] In current study, 10.4% of the parents preferred milk as the transport medium. The rate founded in this study is higher than the rate reported by Özer et al.[6] and similar to Soğukpınar Önsüren et al.[18] Alharbi et al. reported a rate of 27.7 % in parents who transported avulsed teeth in milk.[24]

When asked how do you hold the tooth, 35.2% of the parents stated that they would hold it by the crown. When asked how do you clean the soiled tooth, 23.6% of the parents responded that they would hold it in water without rubbing. Alyahya et al. reported much higher rates than founded in this study for the same items.[30] Alharbi et al. reported rates similar to current results.[24] Although the knowledge level of parents regarding tooth avulsion varies in different countries, the percentages of the findings in the Saudi study are similar to current study. Unfortunately, this shows parents' lack of knowledge about important factors affecting prognosis after reimplantation.

The first institution preferred by the parents for the treatment of avulsed tooth was the dental hospital with 50.8%, followed by the faculty of dentistry with 29.2%. Most of the parents in this study are aware of the need to reach a dentist. While the success rate of teeth reimplanted within the first 30 minutes reaches 90%, the chance of success decreases as the reimplanting time prolongs.[31] In present study, 22.4% of parents responded within 20 minutes when asked how long it would take to reach the dentist. Unfortunately, most of the parents in current study were not aware of the importance of reimplantation of the avulsed tooth immediately or as soon as possible in terms of clinical success. The delay in reaching the dentist may be due to the fact that parents are primarily concerned with bleeding and pain control. 84% of the parents stated that they could not replace the avulsed tooth. The reason for this situation may be the parents' fear of harming their children, lack of knowledge about trauma, and inability to manage stress during trauma. In a study conducted in Türkiye, Güler et al. reported that 28.5% of the parents received professional help within 30 minutes and 77.2% could not replace the avulsed tooth, similar to current results.[19]

An important aspect of the present study is that it includes an item assessing parental awareness when primary tooth avulsion, whereas previous studies mostly included items about permanent tooth avulsion. 37.2% of the parents thought that the avulsed primary tooth should not be reimplanted. Consistent with the present findings, Alharbi et al. reported that 40.7% of parents were aware of the correct treatment of an avulsed primary tooth.[24]

Another important issue in avulsed tooth injuries is sterilization. Since the avulsed tooth is likely to come into contact with soil and dirt, there is a risk of tetanus. In current study, 90.4% of all parents and 91.76% of parents with dental trauma experience were aware of the necessity of tetanus vaccination. Consistent with the present findings, Kaul et al. reported that the most of parents were aware of the necessity of tetanus vaccination.[25]

Limitations

The current study has some limitations. This study was conducted in only one institution and different institutions were not included. A field study involving more institutions could be conducted to get a better idea. This study did not include training on tooth avulsion for parents. The results reflect the parents' personal knowledge and experience. Future studies could be planned to evaluate the attitudes and behaviors of parents before and after training on tooth avulsion. Also, from a broader perspective, further research could be planned to assess the level of knowledge of parents as well as teachers, coaches, doctors and nurses regarding dental trauma. In this way, people's awareness and knowledge levels on trauma management could be assessed and training programs could be planned according to their knowledge levels.

Conclusions

This study revealed that parents do not have sufficient knowledge about the emergency management of tooth avulsion and that university graduates have higher knowledge than primary and high school graduates. Educational programs should be organized in accordance with the educational levels of parents about dental traumas that require emergency treatment management such as tooth avulsion. In current study, it was determined that parents were not willing to receive education about dental trauma. The reasons for parents' reluctance to participate in dental trauma education programs should be revealed and they should be motivated to participate. In addition, in order to increase the awareness of parents about dental trauma, posters with diagrams showing what to do in case of dental trauma can be hung in the emergency departments of hospitals, primary health centers and pediatricians' offices, and social media tools can be used.

Acknowledgements

The author gratefully acknowledges the participation of all parents in this study.

Conflict of Interest Statement

No competing interests.

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