



ORIGINAL ARTICLE

Claudia Letelier¹.
María Hernández¹.

1. Escuela de Odontología, Universidad Austral de Chile, Valdivia, Chile.

Corresponding author: Claudia Letelier. Rudloff 1640 Valdivia, Chile. Phone: (+56) 6395799704 - 63-2293900. E-mail: cletelierfuentalba@gmail.com

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Knowledge of dental trauma in a group of Chilean primary school teachers.

Abstract: Aim: To determine the knowledge and management of dentoalveolar trauma in primary school teachers in rural and urban schools in the district of Paillaco, Chile, in 2014. Methods: An observational study was conducted in 167 teachers in the city of Paillaco. A survey developed from the questionnaires proposed by McIntyre *et al.* and Yassen *et al.* was used. The survey, previously approved by 2 experts, was applied in person in the school facilities, after the application of a pilot test. Demographic characteristics of the participants and the frequency of correct responses by geographical location of the educational establishment (rural/urban) were analyzed. For the inferential analysis, the chi-square and t-tests ($p < .05$) were used. Results: 130 valid questionnaires (41.21 ± 0.95 years, 68.4% women) were obtained. Participating teachers achieved an 83.3% of correct diagnosis of dentoalveolar trauma and a 55.5% of correct answers regarding its management. There were with no statistically significant differences in relation to geographical location. Conclusion: Primary school teachers in the district of Paillaco have a high level of knowledge of dentoalveolar trauma, but not of its management.

Keywords: *Tooth avulsion; Tooth fractures; School teachers; Chile.*

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INTRODUCTION.

The traumatic dental injury (TDI) is a lesion that affects the teeth and their supporting structures after a violent impact. The most common injury in permanent dentition is coronary fracture (51.9%)¹, and dislocation (26%) in primary dentition. Falls are the most common cause in both cases². This type of injury has a high prevalence at national level (30%)^{1,3} mainly at school age².

In the district of Paillaco, located in southern Chile, more than a quarter of the population (27%) is of school age⁴. This is why teachers play an important role in dealing with these traumas^{5,6}, as a timely and immediate response improves the prognosis of the injuries⁵. Several studies have been conducted to measure

the knowledge of TDIs in primary school teachers. Results show that teachers have little knowledge about the management of this type of injuries⁵⁻¹¹. This is worrying considering the emotional, psychological, social and financial impact these injuries have in children, parents and health authorities¹¹⁻¹⁴.

There are no studies in electronic databases assessing the knowledge and management of TDIs in primary schools teachers in Chile. Therefore, it is imperative to gather information on the measures that should be implemented to educate the school community, as these actions would help reduce the consequences of TDIs.

The aim of this study is to determine the level of knowledge and management of dentoalveolar trauma

in a group of Chilean primary school teachers, in the district of Paillaco, 2014.

MATERIALS AND METHODS.

Study design

A descriptive study based on a questionnaire was conducted. The target population was primary school teachers in rural and urban schools in the district of Paillaco. This study was approved by the Research Ethics Committee of the Health Service of Valdivia and by the participating schools.

Population and sample size

The following inclusion criteria were considered: being a classroom school teacher willing to participate in the study, signing informed consent, and teaching in at least one class from 1st to 8th grade. Unlocatable teachers after 3 attempts and incompletely or incorrectly answered questionnaires were excluded from the study.

The study was based on a questionnaire, with a total population of 167 teachers as informed by the Department of Education of Paillaco (as of 2014).

Questionnaire

A written questionnaire adapted from McIntyre *et al.*⁵ and Yassen *et al.*¹¹ was developed. The questionnaire consisted of 3 sections: demographic characteristics, knowledge and management of TDIs. Sections 2 and 3 contained 14 multiple-choice items with only one correct answer.

The instrument was revised and approved by two pediatric dentists expert in this subject. A pilot study was conducted in 15 teachers in Paillaco to evaluate the clarity of the questions and accuracy of the answers. These participants were not included in the study. Appropriate modifications were then made to obtain the final questionnaire.

The questionnaire was administered during September and October 2014. Both the pilot study and the final questionnaire were applied in person at each school during the workday. The session started with a brief introduction to the objectives of the questionnaire. Informed consent was read aloud and then teachers were asked to sign it. A copy of the questionnaire was given to each one of the partici-

pating teachers. In order to protect the anonymity of the respondents, each school was given a sealed box in which teachers left the answered questionnaires. Finally, an instructional poster showing how to act in case of a TDI was given to each participating school.

To reduce the risk of information bias, researchers emphasized the fact that there were no right or wrong answers. The application of the questionnaire was supervised at all times. Participants who were caught cheating were excluded from the study. To control selection bias associated with the denial of individuals to participate, leaflets containing information on the management and prevention of TDIs were distributed to generate interest among the community.

Analysis of data

Data were tabulated in a Google Drive spreadsheet (Google Inc., USA). Descriptive statistics were performed with demographic characteristics (sex, age) of participating teachers and school geographic location (urban/rural). For each teacher the number of correct answers in Section 2 and 3 of the questionnaire was quantified as dependent variable. The association of sex and age of teachers, and frequency of correct answers in relation to the geographical location of the workplace was analyzed according to the chi-square test for proportional variables and t-test ($p < 0.05$). Results are shown in frequency, measures of central tendency and dispersion. All analyzes were performed using SPSS 20 (IBM, USA).

RESULTS.

One hundred and sixty-seven primary school teachers in rural and urban schools in Paillaco were evaluated. Thirty-seven teachers were excluded for the following reasons: submitting incomplete responses (16.30%), cheating or comparing results with another teacher (6.15%), unlocated after the third attempt (6.15%), and not being at work on the day the questionnaire was applied (3.84%).

One hundred and thirty valid questionnaires were analyzed, accounting for 84.4% of the teachers working in Paillaco. Mean age was 41.21 ± 0.95 years (min=23, max=65),

Table 1. Demographic characterization of participating teachers.

Demographic Characteristics		Rural n=72	Urban n=58	Total n=130	p
Sex	Female (%)	44(61.1)	45(75.5)	89(68.4)	0.22 ¹
	Male (%)	28(38.8)	13(22.4)	41(31.5)	
Age (Media±DE*)		40.9±1.3	41.34±1.4	41.21±0.95	0.27 ²

* SD: standard deviation: 1. Chi-square test; 2. T-test

Table 2. Frequency distribution and percentage of correct answers regarding knowledge of TDI.

Items	FREQUENCY OF RESPONSE (%)			p	
	Rural n=72	Urban n=58	Total n=130		
Main cause of TDI	Falls	61(84.7)	52(89.6)	113(86.9)	0.4
	Traffic Accidents	4(5.5)	0	4(3.07)	0.06
	Sports	4(5.5)	3(5.1)	7(5.38)	0.98
	Fights	3(4.1)	3(5.1)	6(4.61)	0.78
Do you think TDI is an emergency?		65(90.27)	54(93.1)	119(91.53)	0.56
Do you think a tooth fracture requires immediate care?		67(93.05)	54(93.1)	121(93.07)	0.99
Do you think a tooth avulsion requires immediate care?		65(90.27)	51(87.93)	116(89.23)	0.66
Would you consult with a professional?	Dentist	69 (95.83)	53 (91.37)	122 (93.84)	0.29
	General practitioner	1 (1.38)	5 (8.62)	6 (4.61)	0.06
Would you go to a primary health care center?	Paillaco Hospital	38 (52.77)	37 (63.79)	75 (57.69)	0.24
	CESFAM Paillaco	20 (27.77)	18 (31.03)	38 (29.23)	0.68
	Rural Health Center	12 (16.66)	3 (5.17)	15 (11.53)	0.04

68.46% were women. (Table 1).

A 26.9% of teachers reported having received prior information through educational lectures (68.5%). A 21.5% admitted having witnessed a TDI associated with a school accident (Table 2).

An 86.9% of teachers said that TDIs are primarily associated with falls. The 93.07% and 89.23% of teachers say that fractures and avulsions, respectively, require immediate care. The 93.84% believe that this care should be provided by a dentist, as first choice (57.69%) in the city hospital.

An 83.3% of the items evaluated in section 2 were correctly answered. No statistically significant differences between urban and rural areas were found. The details of each item are shown in Table 2. An 80% of teachers declared that in case of an avulsion they would look for

the missing tooth, a 76.92% would hold the tooth by the crown and 26.15% would it keep in water. In case of an avulsion, a 72.30% said they would seek professional care at a health center within the first 30 minutes. In case of a tooth fracture, 69.23% of the teachers would look for the missing piece of tooth.

A 30% would keep the piece in water and 22.30% would opt for a napkin. The 64.64% said they would seek professional care at a health center within the first 30 minutes. No statistically significant differences between urban and rural teachers were found. The detail of each item is shown in Table 3.

In 55.5% of the items evaluated regarding management of TDIs were correct. Statistically significant differences between teachers of urban and rural areas were not observed (Table 3).

Table 3. Frequency distribution and percentage of correct answers regarding management of TDI.

Items	FREQUENCY OF RESPONSE (%)			p	
	Rural n=72	Urban n=58	Total n=130		
Would you look for the tooth in case of an avulsion?	59 (81.94)	45 (77.58)	104 (80)	0.53	
Storage medium of avulsed tooth	Napkin	20 (32.25)	11 (62)	31 (23.84)	0.24
	Water	19 (30.64)	15 (30)	34 (26.15)	0.94
	Milk	14 (22.58)	13 (26)	27 (20.76)	0.67
	Alveolus	5 (8.06)	12 (24)	17 (13.07)	0.02*
	Alcohol	4 (6.45)	2 (4)	6 (4.61)	0.56
Part from which you would hold the avulsed tooth	Crown	52 (8)	48 (87.27)	100 (76.92)	0.15
	Root	5 (7.69)	5 (90.9)	10 (7.69)	0.72
	Any part	8 (12.3)	2 (3.6)	10 (7.69)	0.1
Time to look for help in case of an avulsion	Within the first 30 minutes	50 (69.4)	44 (75.86)	94 (72.30)	0.41
	Within the first 24 hours after TDI	22 (30.5)	14 (24.13)	36 (27.69)	0.41
Would you look for the piece of tooth in case of a fracture?	52 (72.2)	38 (65.51)	90 (69.23)	0.2	
Storage medium of fractured tooth	Water	20 (30.3)	19 (38.77)	39 (30)	0.53
	Napkin	19 (28.78)	10 (20.40)	29 (22.30)	0.21
	Alveolus	5 (7.57)	9 (18.36)	14 (10.76)	0.11
	Milk	15 (22.72)	7 (14.28)	22 (16.92)	0.18
	Alcohol	7 (10.60)	4 (8.16)	11 (8.46)	0.56
Time to look for help in case of a fracture	Within the first 30 minutes	48 (66.66)	36 (62.06)	84 (64.64)	0.58
	Within the first 24 hours after TDI	23 (31.94)	22 (37.93)	45 (34.61)	0.47
	The next day	1 (1.38)	0	1 (0.76)	0.36
Reaction in case of an avulsion	You look for the tooth and store it in a napkin	21 (29.16)	16 (27.58)	37 (28.46)	0.84
	You only try to stop the bleeding	18 (25)	12 (20.68)	30 (23.07)	0.56
	You keep the tooth inside the cheek	12 (16.66)	17 (28.31)	29 (22.30)	0.08
	You do not know what to do	13 (18.05)	8 (13.79)	21 (16.15)	0.51
	You put the tooth in the alveolus	8 (11.11)	5 (8.62)	13 (10)	0.63
Reaction in case of a fracture	You only try to stop the bleeding	37 (51.38)	27 (46.55)	64 (49.23)	0.5
	Take the child and the piece of tooth to the health care center	28 (38.88)	28 (48.27)	56 (43.07)	0.28
	You put the tooth in the alveolus	4 (5.55)	1 (1.72)	5 (3.84)	0.25
	You do not know what to do	3 (4.16)	2 (3.44)	5 (3.84)	0.83

DISCUSSION.

Previous studies state that the level of knowledge of TDIs that primary school teachers^{5,6,15-17}, parents or guardians¹⁸, coaches and physical education teachers¹⁹⁻²¹ have is insufficient. This differs from the results of the present study despite the similarity in the target population and the instrument used for registration.

Concerning the knowledge of TDIs, 26.9% of teachers

reported having received information through educational lectures. These results were similar to those obtained in New York City (24%)⁵, but different from those found in Saudi Arabia⁶ and Iraq¹¹. This reveals the differences in exposure to educational activities and training for teachers among different countries.

Of all participants, 21.5% admitted having witnessed a TDI associated with a school accident. This would be linked

to the high prevalence of such accidents in Paillaco. Similar results were obtained by Al-Obaida⁶ and McIntyre *et al.*¹¹ with a 22.7% and 24%, respectively. The vast majority of teachers stated that TDIs would be mainly associated to falls, which coincides with the evidence available at national scale^{1,2}.

On the other hand, a common mistake of most participants (as they wasted valuable time) was having as a first option to take the patient to the hospital in the city of Paillaco (which does not have an oral health care unit) or to a rural health care center (in which the dentist only works once a week). The best choice was the Family Health Center in Paillaco. This situation shows clearly that both rural and urban teachers do not have enough information regarding the regular protocol for managing a school accident involving TDI. Despite this, the vast majority of teachers (93.84%) would consult with a dentist, revealing that teachers actually know who is the most suitable professional to deal with the TDI; they just ignore where to take the injured child. These figures are higher than those reported by Al-Obaida⁶ and Yassen *et al.*¹¹ with 43% and 42%, respectively.

Most teachers would look for the avulsed tooth or broken piece. However, the storage medium of choice (water) would not be beneficial, affecting considerably the prognosis of treatment. These last findings contrast with the results obtained by Yassen *et al.*¹¹, in which participants opted for using a napkin as storage medium. This clearly shows the

interest of teachers to act immediately in case of TDI; however, specific training is essential to ensure a timely and appropriate intervention. In case of a fracture or avulsion, most teachers would look for help at a health center within the first 30 minutes. This reveals that teachers recognize that the TDI patient needs urgent care. This allows the dentist to act within the period in which the cells still remain viable, increasing the likelihood of successful treatment.

Within the limitations of this study we find that the sample is only representative of the district of Paillaco. This does not allow the extrapolation of the results to the Chilean population. In addition, the questionnaire used in this study requires a more rigorous validation process. Despite these limitations, the data are useful in determining the guidelines for future studies on this subject as the lack of national studies hinders the possibility of making comparisons at local level.

CONCLUSION.

The primary school teachers in the district of Paillaco have a high level of knowledge of dentoalveolar trauma, but not of its management.

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Conocimientos sobre trauma dental en un grupo de profesores chilenos de educación básica.

Resumen: Objetivo: Determinar el nivel de conocimiento y manejo del traumatismo dentoalveolar en un grupo de profesores chilenos de enseñanza básica, ciudad de Paillaco, año 2014. Metodología: Se realizó un estudio observacional de tipo censal en 167 profesores de Paillaco. Se utilizó una encuesta elaborada a partir de los cuestionarios propuestos por McIntyre *et al.* y Yassen *et al.* La encuesta se aplicó de forma presencial en las escuelas tras una prueba piloto y aprobación por 2 expertos. Se analizaron las características demográficas de los participantes y la frecuencia de respuestas correctas según ubicación geográfica del establecimiento educacional

(rural/urbano). Para el análisis inferencial se utilizaron las pruebas de chi-cuadrado y t-test ($p < .05$). Resultados: Se obtuvieron 130 cuestionarios válidos (41,21±0,95 años, 68,4% mujeres). Los profesores participantes lograron un 83,3% de respuestas correctas sobre diagnóstico de trauma dentoalveolar y un 55,5% de respuestas correctas sobre su manejo, sin diferencias estadísticamente significativas según ubicación geográfica. Conclusión: Los profesores de enseñanza básica de la comuna de Paillaco presentan un alto nivel de conocimiento sobre trauma dentoalveolar, pero no sobre su manejo.

Palabras clave: *Avulsión dentaria, Fractura dentaria, Profesores, Chile.*

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