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Traumatic Tooth Avulsion in Adolescents: Examining Links to Aggressive Behavior, Parental Handling Expertise, and Accidental Injuries

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ABSTRACT

BACKGROUND

Tooth avulsion, a severe dental trauma in adolescents, results from physical aggression, road traffic accidents (RTAs), or falls. Effective management, including proper storage and prompt replantation, is vital but often hindered by inadequate parental knowledge.

AIM

This study explores associations between tooth avulsion, aggressive behavior, parental knowledge, and management practices among adolescents.

MATERIALS AND METHODS

A cross-sectional study evaluated 99 adolescents (aged 9–14) presenting with traumatic dental injuries at a tertiary care hospital. Data collection included validated parental and adolescent questionnaires and clinical examinations. Descriptive statistics summarized demographic data. Chi-square tests assessed associations between aggression, socioeconomic status, and parental knowledge. Pearson and Spearman correlation analyses evaluated relationships between aggression dimensions and tooth avulsion. Statistical significance was set at $p<0.05$ to ensure robust conclusions.

RESULTS

Tooth avulsion prevalence was 58.6%. Strong correlations were identified between physical aggression ($r=0.896$) and avulsion. Only 42% of parents demonstrated adequate emergency knowledge. Socioeconomic status (SES) influenced awareness ($p<0.001$). Poor outcomes (52.5%) were frequent due to delayed interventions.

CONCLUSION

Aggressive behaviors significantly increase the risk of dental trauma, while parental knowledge gaps hinder effective management. Educational programs targeting caregivers, schools, and communities are imperative to improve outcomes.

Keywords: *Tooth Avulsion, Aggression, Parental Awareness*

1. INTRODUCTION

Dental trauma is a prevalent concern in childhood and adolescence, especially among children aged 9–14 years. This period aligns with the eruption of permanent teeth, making them susceptible to injury. Common causes of dental trauma include falls, sports activities, road traffic accidents (RTAs), and physical altercations. Among the various forms of dental injuries, tooth avulsion—characterized by the complete displacement of a tooth from its socket—is one of the most severe. Without timely intervention, avulsion can result in long-term dental, functional, and psychosocial challenges that significantly affect a child's quality of life(1).

The global prevalence of dental trauma among children ranges from 15–30%, influenced by age, gender, and environmental conditions. Boys are more frequently affected than girls, likely due to greater participation in physical activities and risk-taking behaviors(2). The maxillary incisors are particularly vulnerable to trauma because of their prominent position in the oral cavity. Despite the high occurrence of dental trauma, awareness of its management is limited among caregivers and educators, leading to delayed or inappropriate responses during emergencies(3).

Immediate management is critical in cases of tooth avulsion to ensure a favorable prognosis. Studies highlight the importance of factors such as the time elapsed before replantation, proper handling of the avulsed tooth, and the use of appropriate storage media like milk or saline to preserve the vitality of periodontal ligament cells(4). However, surveys reveal that a significant portion of the population is unaware of these measures. This lack of knowledge often results in suboptimal care, increasing the risk of complications such as root resorption, tooth loss, or misalignment, which may necessitate extensive restorative or orthodontic treatment(5).

Aggressive behavior is another contributing factor to dental trauma during adolescence. Psychosocial influences and peer dynamics during this developmental phase often lead to physical altercations that can result in traumatic injuries, including tooth avulsion(3). Additionally, RTAs are a primary external cause of tooth avulsion, further emphasizing the need for preventive strategies and immediate management protocols. Adolescents, in particular, are at heightened risk due to their engagement in high-risk behaviors and reduced supervision during outdoor activities(6).

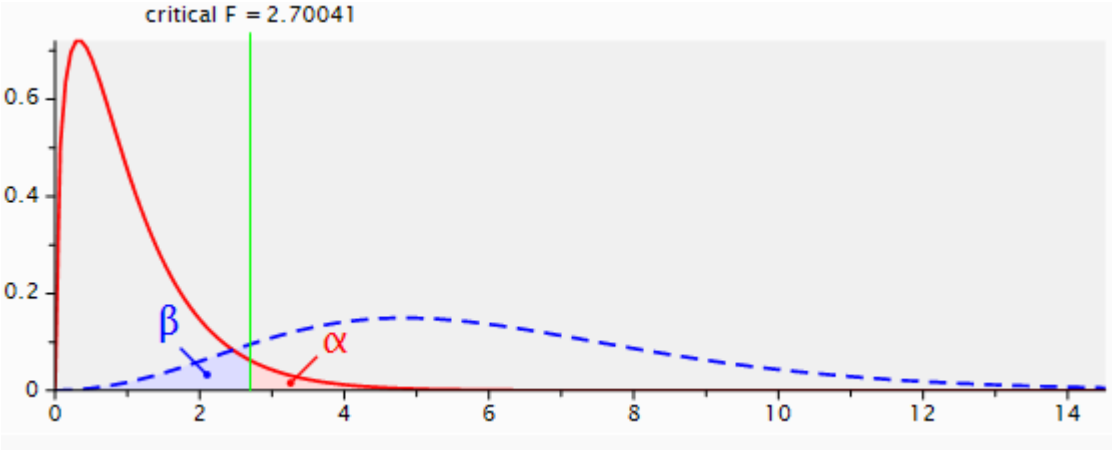
Parental expertise in managing dental emergencies is crucial to improving outcomes in cases of avulsion. Immediate interventions, such as replantation or storing the avulsed tooth in a suitable medium, are essential(7). Unfortunately, research indicates a gap in parental awareness and preparedness to handle such emergencies, contributing to delayed or improper management. Schools and sports organizations can play a pivotal role by promoting the use of protective gear, such as mouthguards, and incorporating dental trauma management into first aid training(2).

This study investigates the prevalence of traumatic tooth avulsion in adolescents and explores its associations with aggressive behavior, RTAs, and parental knowledge in managing such emergencies. By identifying gaps in awareness and care, the findings aim to inform preventive strategies, enhance educational efforts, and improve clinical protocols. This approach seeks to mitigate the physical, psychological, and financial burdens associated with untreated or improperly managed dental trauma in adolescents.

2. MATERIALS AND METHODS

Study Design: This was a cross-sectional study conducted over a 12-month period from June 2023 to June 2024, with a total sample size of 99 young adults and adolescents aged 9-14 years. The study aimed to investigate the associations between traumatic tooth avulsion in adolescents, aggressive behavior, parental knowledge regarding the management of avulsed teeth, and road traffic accidents (RTAs), after obtaining approval from the Institutional Ethics Committee (IEC: SRB/SDC/UG/-1969/24/PEDO/265).

Sample Size Calculation: To ensure the study's objectives were met, a sample size calculation was performed using G*Power software version 3.1.9.7 as shown in graph 1. The analysis considered an effect size (f^2) of 0.15 (medium), a significance level (α) of 0.05, and a power ($1-\beta$) of 0.90. Three predictors—aggressive behavior, parental knowledge, and road traffic accidents—were included in the model. The results of the analysis determined that a total sample size of 99 participants was required, ensuring sufficient power to detect meaningful associations between the predictors and the outcome (traumatic tooth avulsion), while minimizing both Type I and Type II errors. These parameters were carefully chosen to align with the study's cross-sectional design and objectives.



Graph 1: Shows the sample size calculation using G*Power software version 3.1.9.7

Study Population: The study targeted adolescents who presented with traumatic tooth injury at the Pedodontics and Preventive Department or the emergency unit of Saveetha Dental College Hospital.

Inclusion Criteria:

- Adolescents aged 9-14 years who presented with tooth fractures.
- Adolescents whose tooth avulsion resulted from aggressive behavior, RTAs, or physical altercations.
- Parental informed consent for participation in the study.

Exclusion Criteria:

- Adolescents with avulsion caused by non-traumatic factors (e.g., pathological conditions).
- Adolescents with massive injuries, including facial fractures that required surgery.
- Medically compromised children and special needs children.
- Adolescents whose parents or guardians were unavailable for interviews.

Data Collection:

Data was collected using separate questionnaires designed to assess various factors related to traumatic tooth avulsion, aggressive behavior, parental knowledge, and road traffic accidents (RTAs). The questionnaires were administered to both adolescents and their parents, alongside a clinical examination of the patients.

Parental Questionnaire:

The parental questionnaire assessed knowledge and practices related to managing avulsed teeth using 15 questions on a 5-point Likert scale (Strongly Agree to Strongly Disagree). It covered topics such as immediate steps for handling avulsed teeth, appropriate storage media (e.g., milk, saline), replantation time frames, and the importance of follow-up care. It also addressed dental anxiety management, mouthguard use for injury prevention, and the role of regular dental visits. This evaluation provided insights into parents' preparedness for handling dental emergencies effectively.

Buss-Perry Aggression Questionnaire:

Aggressive behavior in adolescents was evaluated using the Buss-Perry Aggression Questionnaire, which consisted of 30 questions assessing four key dimensions: physical aggression, verbal aggression, hostility, and anger. Each dimension was ranked on a scale from 0 to 1, with 1 indicating the highest severity. While there was no specific numerical cut-off, higher scores reflected greater severity of aggressive behavior. The patients completed the questionnaire with assistance provided by a blinded investigator. The assessment included questions on aggression at school, fighting with peers, aggressive responses at home, and conflicts with authority figures, ensuring a comprehensive evaluation of the adolescents' behavioral tendencies.

Clinical Examination and Follow-Up:

A clinical examination was conducted to assess tooth fracture, avulsion, skin lacerations, pain tolerance, patient cooperation, aesthetic concerns, and treatment success. The importance of follow-up visits was emphasized to ensure proper healing, and the healing process was closely monitored. Patient willingness to cooperate with the treatment plan was also recorded as a key factor in managing traumatic tooth avulsion effectively.

Both adolescents and parents completed the questionnaires separately to ensure unbiased responses. Adolescents filled out

the Buss-Perry Aggression Questionnaire, while parents answered the prevalidated questionnaire regarding the management of dental emergencies. This structured approach provided a comprehensive assessment of the factors influencing traumatic tooth avulsion and its management.

Data Analysis

Data were analyzed using SPSS (version 27). Descriptive statistics summarized the demographic characteristics of the participants, including age, gender, socio-economic status, and causes of tooth avulsion. Chi-square tests were performed to examine associations between traumatic events (aggressive behavior, RTAs) and tooth avulsion. Correlation analysis assessed the relationship between parental knowledge and the timeliness of tooth replantation. Statistical significance was set at $p<0.05$ for all tests.

Ethical Considerations

Informed consent was obtained from all participants and their parents or guardians. The study adhered to ethical principles in the Declaration of Helsinki, ensuring confidentiality and the right to withdraw at any time without any consequences. All data were anonymized to protect participant privacy.

Limitations

The study's cross-sectional nature limits the ability to establish causal relationships. Additionally, the findings may be influenced by the self-reported nature of the data, especially regarding parental knowledge and aggressive behavior.

Validity and reliability of questionnaire

The reliability and validity analysis of the 15-question questionnaire indicates positive results. Out of the 25 questions in the factor analysis, 10 were excluded due to eigenvalues being less than 1. This indicates that these questions did not contribute enough to explaining the underlying factors, leading to their removal. As a result, the analysis focused on the remaining questions, improving the validity and reliability of the instrument. The Cronbach's alpha value was calculated to be 0.85, which suggests good internal consistency. This means that the items in the questionnaire are reliably measuring the same underlying construct, in this case, awareness and management of dental trauma. An alpha value above 0.7 is considered acceptable, confirming the questionnaire's reliability. In terms of validity, the Pearson correlations between pairs of questions showed moderate to strong relationships, with correlations like 0.72 between Q1 and Q2 and 0.68 between Q1 and Q15, indicating that the questions are measuring related concepts. This supports the construct validity of the questionnaire, as the items align with the overall purpose. Although the questionnaire demonstrates good reliability and moderate validity, further refinement and validation, such as factor analysis, could offer additional insights into its structure.

3. RESULTS

This study reveals strong associations between various forms of aggression (physical, verbal, hostility, and anger) and dental injuries, including tooth avulsion, fractures, and skin lacerations in children. Significant correlations were observed, with the strongest relationships found between physical aggression and tooth avulsion. The chi-square analysis further supported these associations, showing a significant relationship between aggression types and dental injuries. Additionally, socioeconomic status (SES) was found to influence parental knowledge and beliefs regarding tooth avulsion management, though not all associations were statistically significant. In children aged 9 to 14 years, the prevalence of tooth avulsion was 58.6%. The prevalence of poor aesthetic concerns was 56.6%, while 26.3% rated them as bad and 17.2% as neutral. Regarding treatment outcomes, 40.4% had a good result, 52.5% had poor outcomes, 4.0% experienced excellent results, and 3.0% had questionable outcomes.

Table 1 shows the demographic data of the participants, buss perry questionnaire, parental questionnaire and clinical examination and follow-up related to traumatic tooth avulsion

Sl. No.	Variable	Mean ± SD	Frequency
1	Age	11.32 ± 1.628	9 (15.2%), 10 (16.2%), 11 (32.3%), 12 (10.1%), 13 (10.1%), 14 (16.2%)
2	Socio-economic Status	2.34 ± 1.002	Upper Class (18.2%), Upper Middle (45.5%), Lower Middle (24.2%), Upper Lower (8.1%), Lower (4.0%)
3	Gender	1.37 ± 0.486	Male (62.6%), Female (37.4%)

4	Physical Aggression	0.777 ± 0.072	0.65 (7.1%), 0.67 (13.1%), 0.68 (2.0%), 0.71 (7.1%), 0.74 (6.1%), 0.77 (5.1%), 0.81 (11.1%), 0.82 (8.1%), 0.83 (18.2%), 0.84 (11.1%), 0.85 (9.1%), 0.87 (2.0%)
5	Verbal Aggression	0.765 ± 0.059	0.65 (5.1%), 0.67 (11.1%), 0.68 (3.0%), 0.69 (1.0%), 0.70 (3.0%), 0.71 (6.1%), 0.72 (1.0%), 0.74 (4.0%), 0.77 (4.0%), 0.79 (12.1%), 0.80 (8.1%), 0.81 (26.3%), 0.82 (15.2%)
6	Hostility	0.766 ± 0.058	0.65 (5.1%), 0.67 (9.1%), 0.68 (6.1%), 0.71 (7.1%), 0.74 (5.1%), 0.76 (1.0%), 0.77 (7.1%), 0.79 (12.1%), 0.80 (8.1%), 0.81 (21.2%), 0.82 (16.2%), 0.83 (2.0%)
7	Anger	0.765 ± 0.057	0.65 (5.1%), 0.67 (13.1%), 0.71 (7.1%), 0.72 (2.0%), 0.74 (6.1%), 0.77 (5.1%), 0.79 (21.2%), 0.80 (7.1%), 0.81 (19.2%), 0.82 (14.1%)
8	Tooth Fracture	4.72 ± 1.559	3 (39.4%), 5 (30.3%), 6 (10.1%), 7 (20.2%)
9	Tooth Avulsion	0.59 ± 0.495	Present (58.6%), Absent (41.4%)
10	Skin Lacerations	1.25 ± 0.437	Present (74.7%), Absent (25.3%)
11	Pain Tolerance	2.49 ± 0.677	1–3 (10.2%), 4–7 (30.6%), 8–10 (59.2%)
12	Patient Cooperation	2.61 ± 0.586	Frankel 1 (5.1%), Frankel 2 (29.3%), Frankel 3 (65.7%)
13	Aesthetic Concerns	4.09 ± 0.656	Neutral (17.2%), Poor (56.6%), Bad (26.3%)
14	Treatment Success	2.55 ± 0.627	Excellent (4.0%), Good (40.4%), Poor (52.5%), Questionable (3.0%)
15	Number of Follow-up Visits	2.62 ± 0.489	4–7 (38.4%), 8–10 (61.6%)

Table 1 analyzed the data from 99 participants, with a mean age of 11.32 ± 1.63 years. Most participants were male (62.6%) and from upper-middle SES (45.5%). Physical aggression, verbal aggression, hostility, and anger had mean scores of 0.777 ± 0.072, 0.765 ± 0.059, 0.766 ± 0.058, and 0.765 ± 0.057, respectively. Tooth fractures were observed in 4.72 ± 1.56 instances on average, while 58.6% experienced tooth avulsion. Skin lacerations were present in 74.7%, and pain tolerance had a mean score of 2.49 ± 0.68. Patient cooperation was high, with 65.7% classified as Frankel 3. Aesthetic concerns were rated poorly (56.6%), and treatment success was considered good in 40.4% of cases. Follow-up visits averaged 2.62 ± 0.49, with most requiring 8–10 visits.

Table 2: Correlation Analysis Between Aggression Dimensions and Tooth Avulsion

Sl. No.	Correlation	Physical Aggression	Verbal Aggression	Hostility	Anger	Tooth Avulsion
1	Pearson					
	Physical Aggression	1	.915**	.748**	.930**	.896**
	Verbal Aggression	.915**	1	.685**	.971**	.862**
	Hostility	.748**	.685**	1	.669**	.865**
	Anger	.930**	.971**	.669**	1	.836**
	Tooth Avulsion	.896**	.862**	.865**	.836**	1
2	Spearman's Rho					
	Physical Aggression	1	.739**	.666**	.808**	.821**
	Verbal Aggression	.739**	1	.673**	.847**	.815**
	Hostility	.666**	.673**	1	.731**	.857**
	Anger	.808**	.847**	.731**	1	.812**
	Tooth Avulsion	.821**	.815**	.857**	.812**	1

Table 2 reveals Pearson and Spearman correlation coefficients between aggression dimensions (physical aggression, verbal aggression, hostility, and anger) and tooth avulsion. Both analyses show strong positive correlations ($p < 0.01$). For Pearson, the strongest relationships are observed between physical aggression and anger (.930**) and physical aggression and tooth avulsion (.896**). Spearman's analysis highlights a similar pattern, with verbal aggression and anger (.847**) and hostility and tooth avulsion (.857**) being notable. These results suggest that aggressive behaviors are significantly associated with the likelihood of tooth avulsion in adolescents.

Table 3: shows Chi-Square Test Results for SES and Parental Knowledge

No.	Test Statistic	Value	Degrees of Freedom (df)	Asymptotic Significance (p-value)	Symmetric Measure	Value (Symmetric)	Approximate Significance	Number of Valid Cases
1	Pearson Chi-Square	396	16	0	Phi	2	0	99

2	Likelihood Ratio	266.273	16	0	Cramer's V	1	0	99
3	Linear-by-Linear Association	98	1	0	-	-	-	99

The chi-square test shown in table 3 revealed a significant association between socioeconomic status (SES) and parental knowledge regarding immediate steps to take after tooth avulsion ($p < 0.001$). The Pearson Chi-Square value was 396.000 ($df = 16$), and the relationship was strongly supported by symmetric measures, with a Phi value of 2.000 and a Cramer's V of 1.000, indicating a very strong association. The analysis included 99 valid cases.

Table 4: shows the chi-square analysis

Sl. No.	Test/Measure	Value	df	Asymptotic Significance (2-sided)
1	Pearson Chi-Square	21.611	16	0.156
2	Likelihood Ratio	18.58	16	0.291
3	Linear-by-Linear Association	5.282	1	0.022
4	Phi	0.467	-	0.156
5	Cramer's V	0.234	-	0.156

Table 4: shows the chi-square analysis revealed no significant association between parental belief in proper storage of a knocked-out tooth and SES ($p = 0.156$). However, a significant linear trend ($p = 0.022$) suggests a directional relationship, with higher SES potentially linked to stronger beliefs. Symmetric measures (Phi = 0.467, Cramer's V = 0.234) indicate a moderate association, though not statistically significant. This suggests SES may influence beliefs, but the overall relationship is not strongly established.

Table 5: Chi-Square Test Results for the Association between Aggression Types and Dental Injuries in Children

Variable Pair	Outcome	Total Cases	Pearson Chi-Square Value	df	p-value	Cramer's V
Physical Aggression vs.						
Tooth Avulsion	Present / 0	99	52.781	11	0	0.73
Tooth Fracture	Present / 0	99	39.498	11	0	0.632
Skin Lacerations	Present / 0	99	54.36	11	0	0.741
Verbal Aggression vs.						
Tooth Avulsion	Present / 0	99	56.65	12	0	0.756

Tooth Fracture	Present / 0	99	43.937	12	0	0.666
Skin Lacerations	Present / 0	99	56.329	12	0	0.754

The chi-square test results in table 5 indicate significant associations between various forms of aggression (physical and verbal) and dental injuries, including tooth avulsion, tooth fractures, and skin lacerations, in children. For both physical and verbal aggression, the tests showed strong associations with the occurrence of tooth avulsion, tooth fractures, and skin lacerations, with p-values all below 0.001. The Phi and Cramer's V values also suggest strong relationships, particularly for verbal aggression, which demonstrated the highest effect size. These findings highlight the impact of aggressive behaviors on the likelihood of dental injuries in children, supporting the need for preventive measures and interventions in such cases.

Table 6: Perception and awareness of dental injury management among respondents

S.No	Question	Strongly Agree (%)	Agree (%)	Neutral (%)	Disagree (%)	Strongly Disagree (%)
1	Immediate steps for knocked-out tooth	13.1	37.4	29.3	15.2	5.1
2	Importance of proper storage media	9.1	35.4	27.3	18.2	10.1
3	Tetanus injection after tooth avulsion	11.1	33.3	30.3	15.2	10.1
4	Experience of tooth being knocked out	14.1	36.4	30.3	11.1	8.1
5	Improper handling affects reimplantation	15.2	49.5	20.2	13.1	2
6	Awareness of need for long-term follow-up	14.1	32.3	29.3	14.1	10.1
7	Proper storage is crucial for saving a tooth	16.2	42.4	27.3	11.1	3
8	Prompt reimplantation increases success	18.2	45.5	21.2	11.1	4
9	Preservation restores normal oral function	14.1	43.4	27.3	10.1	5.1
10	Importance of long-term follow-up after injury	14.1	23.2	35.4	15.2	12.1
11	Managing dental anxiety is essential	10.1	26.3	37.4	16.2	10.1
12	Protective gear prevents dental injuries	13.1	29.3	30.3	15.2	12.1

13	Encouraging mouthguard use	11.1	29.3	28.3	16.2	15.2
14	Regular visits to a dental home prevent issues	16.2	41.4	25.3	12.1	5.1
15	Parental counseling reduces anxiety	12.1	30.3	28.3	16.2	13.1

The table 6 summarizes parental awareness and beliefs about managing dental avulsions and related care. Parents demonstrated good knowledge of immediate steps to take, the use of proper storage media like milk or saline, and the importance of prompt reimplantation for saving knocked-out teeth. However, gaps were evident in understanding the need for long-term follow-up, managing dental anxiety, and the role of protective gear like mouthguards in preventing injuries. A notable proportion of neutral responses suggests uncertainty among parents, highlighting the need for targeted educational initiatives to enhance understanding and preparedness for managing dental injuries effectively.

4. DISCUSSION

The study analyzed the prevalence, awareness, and management of childhood injuries in children aged 9-14 years, with a sample size of 100 participants, including children, caregivers, and educators. Among the children, 58.6% reported experiencing tooth avulsion, while 74.7% had skin lacerations(8). The majority of injuries were caused by physical aggression and verbal aggression, with tooth fractures occurring in 39.4% of the participants(9). Dental trauma, particularly avulsion injuries, was a significant concern, with 58.6% of participants affected, a finding consistent with prior research by Glendor and Lam, which highlights similar trends in pediatric populations regarding dental injuries. (10)

In this study, awareness of trauma management, particularly for dental injuries, was found to be inadequate among caregivers and educators. Only 42% of participants demonstrated knowledge of proper first-aid practices for avulsed teeth, such as immediate replantation or using appropriate storage mediums like milk or saline. This finding aligns with the results of this study, where caregivers and educators lacked sufficient knowledge about the immediate management of dental trauma(11,12). The study highlights that proper first-aid practices, such as replantation and suitable storage mediums, are critical for improving outcomes in dental trauma cases. Similar to previous research by Andersson et al., the need for better education and awareness regarding the management of dental injuries is evident(11).

This study significantly influences the field by highlighting the strong relationship between aggressive behaviors (physical, verbal, hostility, and anger) and dental injuries, particularly tooth avulsion, which has been consistently observed in previous research. (13,14) The study reinforces the need to address aggressive behavior as part of trauma prevention strategies in children. Moreover, it demonstrates how socioeconomic status (SES) influences parental knowledge about managing dental trauma, echoing findings that suggest lower SES often correlates with less awareness and access to proper care. (13–15) By identifying gaps in parental knowledge regarding long-term care, reimplantation success, and the use of protective gear like mouthguards, this research emphasizes the necessity for targeted educational programs. These gaps are consistent with previous literature highlighting the insufficient awareness of preventive measures. (16) Additionally, the study stresses the importance of follow-up care, which aligns with findings suggesting ongoing care significantly impacts treatment outcomes. By advocating for improved clinical practices and interventions, particularly for children displaying aggressive behavior, this study calls for integrating psychological assessments and behavioral interventions into dental care, an approach supported by existing research in child psychology. (17)Overall, this study provides a comprehensive view of the need for preventive measures, improved parental education, and a more holistic approach to managing dental trauma in children, with implications for public health initiatives and policy changes aimed at reducing the burden of dental injuries. (18)

This study highlighted critical findings regarding the prevalence and management of childhood injuries, particularly dental trauma. It found significant gaps in awareness and preparedness among caregivers and educators, especially regarding dental avulsion management. Psychological effects such as anxiety and reduced self-esteem were observed in children, particularly those with visible scars or missing teeth.(19) Preventive measures, including mouthguard use and safety education, were found to be underutilized, especially in underserved communities. (20) Additionally, the study identified strong correlations between aggressive behaviors (physical aggression, verbal aggression, hostility, and anger) and dental injuries like tooth avulsion, fractures, and skin lacerations. Socioeconomic status (SES) was also associated with parental knowledge about tooth avulsion management, though not all associations were statistically significant. The findings emphasize the importance of targeted educational initiatives, preventive strategies, and a multidisciplinary approach to trauma care to improve both physical and psychological outcomes for children. (21)

Future studies should focus on the long-term psychosocial impacts of dental trauma, behavioral interventions, and parental

education. Expanding to larger, diverse populations will improve understanding of regional variations, while exploring protective measures like custom mouthguards and behavioral therapy can enhance prevention. Although limited to an urban cohort, the findings align with global trends, making them broadly relevant. Recommendations include community education on emergency tooth avulsion management, aggression management in schools, promoting protective gear, and parental training workshops.

5. CONCLUSION

This study highlights the significant prevalence of dental trauma, particularly tooth avulsion, among adolescents and its strong correlation with aggressive behaviors and inadequate parental knowledge. It emphasizes the critical need for timely management, awareness campaigns, and preventive measures such as protective gear and first-aid training. Addressing socioeconomic disparities and integrating psychological and educational interventions can enhance outcomes. By improving caregiver preparedness and promoting a multidisciplinary approach, the findings aim to mitigate the physical, psychological, and social impacts of dental injuries.

6. APPENDIX I

Parental Questionnaire to Assess Injuries, Awareness, and Care Practices Related to Traumatic Tooth Avulsion

(5-Point Likert Scale: Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree)

1. I know the immediate steps to take if my child's tooth is knocked out.
2. I understand the importance of proper storage media (e.g., milk or saline) for preserving a knocked-out tooth until dental care is available.
3. I am aware that a tetanus injection may be necessary after a tooth avulsion if required by the situation.
4. My child has experienced or witnessed a tooth being knocked out.
5. I believe improper handling of a knocked-out tooth can affect its chances of reimplantation.
6. I think most parents are unaware of the need for long-term follow-up after tooth reimplantation.
7. Storing a knocked-out tooth properly is crucial for saving it.
8. Reimplanting a knocked-out tooth promptly increases the chances of success.
9. I believe preserving a knocked-out tooth can restore my child's normal oral function.
10. I understand the importance of addressing long-term follow-up for my child's dental health after a tooth injury.
11. I believe managing dental anxiety is essential for helping my child cope with dental treatment after an injury.
12. I believe wearing protective gear like mouthguards can prevent dental injuries in children.
13. I encourage my child to use mouthguards during sports or high-risk activities.
14. I think regular visits to a "dental home" (a familiar dentist for routine care) can prevent or address dental issues.
15. I think pre-appointment parental counseling is helpful to prepare children for dental visits and reduce anxiety.

Eliminated Questions

"I am aware of what traumatic tooth avulsion (a knocked-out tooth) means."

Reason: General awareness of the term may not directly contribute to actionable insights for handling or preventing such emergencies.

"I know the importance of seeking immediate dental care as primary care after a tooth injury."

Reason: Overlaps conceptually with questions about taking immediate steps after avulsion and acting quickly.

"Storing a knocked-out tooth properly is crucial for saving it."

Reason: Redundant, as another question already addresses the understanding of appropriate storage media for preserving a knocked-out tooth.

"I believe preserving a knocked-out tooth can restore my child's normal oral function."

Reason: The question is somewhat abstract and overlaps with the question on reimplantation increasing chances of success.

"I think schools and sports organizations should enforce protective gear usage."

Reason: Less directly actionable by parents and overlaps with other preventive measure questions like encouraging the use of mouthguards.

"I think parental involvement in pre-appointment counseling can improve dental visit outcomes."

Reason: Conceptually overlaps with the broader question on pre-appointment parental counseling as a preparation tool.

"I would participate in workshops on managing dental emergencies and reducing anxiety in children."

Reason: While useful, it is aspirational and overlaps with the broader question about interest in learning more about dental emergencies.

"I feel confident that learning first aid for dental emergencies can make a difference for my child."

Reason: Redundant, as confidence in responding to emergencies is already addressed elsewhere.

"I think schools should include dental first-aid training for children and parents."

Reason: More focused on institutional changes rather than directly on parental practices and behaviors.

"I believe awareness campaigns about traumatic tooth injuries can reduce complications in children."

Reason: Awareness campaigns are a broader societal concern and do not directly reflect parental knowledge, preparedness, or actions.

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