

**How to Cite:**

Amrithaa, B., Govindaraju, L., Jeevanandan, G., Maganur, P. C., & Vishwanathaiah, S. (2022). Prevalence of dental trauma and its association with gender among age group of 2-6 year. *International Journal of Health Sciences*, 6(S1), 11257–11267. <https://doi.org/10.53730/ijhs.v6nS1.7760>

## **Prevalence of dental trauma and its association with gender among age group of 2-6 year**

**B. Amrithaa**

Research Associate, Saveetha Dental College and Hospitals, Saveetha Institute of Medical and Technical Sciences, Saveetha University, Chennai, Tamil Nadu, India

**Lavanya Govindaraju**

Senior Lecturer, Department of Pedodontics, Saveetha Dental College and Hospitals, Saveetha Institute of Medical and Technical Sciences, Saveetha University, Chennai, Tamil Nadu, India

**Ganesh Jeevanandan**

Associate Professor, Department of Pedodontics, Saveetha Dental College and Hospitals, Saveetha Institute of Medical and Technical Sciences, Saveetha University, Chennai, Tamil Nadu, India  
Corresponding author email: [helloganz@gmail.com](mailto:helloganz@gmail.com)

**Prabhadevi C Maganur**

Associate Professor, Department of Preventive Dental Sciences, Division of Pediatric Dentistry, College of Dentistry, Jazan University, Jazan, Saudi Arabia

**Satish Vishwanathaiah**

Associate Professor, Department of Preventive Dental Sciences, Division of Pediatric Dentistry, College of Dentistry, Jazan University, Jazan, Saudi Arabia

**Abstract**--Background: Traumatic dental injuries (TDI) are the dental circumstances with high predominance rate and generally connected with impact on children. Dental injury can cause distress and loss of limit has the potential for periapical sequelae, which give an unfriendly impact on the occasion of the extremely durable teeth additionally as the creating impediment. Aim: To assess the prevalence of dental trauma and its association with gender among age groups of 2-6 years. Materials and Methods: The study was carried out among patients who answered to Saveetha Dental College with traumatic injuries such as avulsion, intrusion, extrusion and luxation of age group of 2-6 years. The data was entered into SPSS after the variables were coded. Categorical factors were reported as far as numbers and reference charts were generated using SPSS version 23. The Chi Square test was used to test the statistical analysis of the

associations. Results: Among 40 children, who were affected by dental trauma, 62.5% were males and 37.5% are females. As a total count males were higher in count of 23 patients when compared to females 17 patients. Conclusion: Based on the current study it can be concluded that, the prevalence of dental injuries to the primary anterior teeth is relatively high. Dental trauma is more prevalent among males than females and it has been shown that the age group between 4 - 6 years.

**Keywords**---Children, Dental trauma, Gender, Primary teeth, Tooth injury.

## **Introduction**

Traumatic dental injuries (TDI) are the dental circumstances with high predominance rate and generally connected with impact on children(1). Dental injury can cause distress and loss of limit has the potential for periapical sequelae, which give an unfriendly impact on the occasion of the extremely durable teeth additionally as the creating impediment(1). Trauma that occurs in the oral cavity of the primary teeth can create some issues to the development of permanent teeth, like hypoplasia, staining, and caries in growing of permanent teeth, and tooth arrangement(2). Types of injury that fall under dental trauma are Chipped teeth, Tooth fractures, including root fractures, enamel fractures, subluxation, intrusion, avulsion, fracture of the tooth socket walls, jaw fracture and lacerations of gums, etc(3).

Dental injury is a most common oral trauma of which avulsion of teeth is more serious. Dental avulsion is the complete uprooting of a tooth from its attachment in alveolar bone which causes injury(4). Dislocation of tooth from axial direction to alveolar bone is intrusive luxation. This dislocation is viewed as complete when the tooth is encompassed by surrounding tissues or incomplete when the incisal border of the crown is noticeable(5). Intrusion is transporting the tooth into the deep alveolar socket, which causes damage to the pulp and periodontium(6). Most complications are from really small children and therefore the risk of causing the natural permanent tooth makes the management of those injuries challenging(7). An extrusion is a movement of a tooth from its socket, where the teeth can give sensitivity and cause intense pain(8).

Risk and seriousness to dental injury differ reliable to the age, sex, and site of the tooth inside the oralcavity(9). There is a serious level of pervasiveness among anterior dental injury contrasted with back teeth(10). Preschool kids are more vulnerable to TDI because of unfortunate stability, inactive reflexes and endless developments(11). Trauma diagnosis and therapy need to perform steady with explicit conventions, overseeing a consideration pathway that initially includes the exact assortment of the clinical record and thusly the conditions of the traumatic events, and go on with an underlying period of correct clinical and radiological testing, a subsequent stage including explicit restorative administration, and a third observing over the period of the patient(12).

Dental injuries to the primary dentition are frequently ignored by guardians principally in light of the fact that less consideration is given to the essential dentition and to the youngster's inability to adapt to the circumstance. So this research is used to obtain information on the amount and to know types of dental trauma that occur in children between the age group of 2-6 years. Our group has broad information and exploration experience that has converted into great distributions(13–25)(26–32).The aim of the current study is to assess the prevalence of dental trauma and its association with gender among age groups of 2-6 years.

## **Materials and Method**

A cross sectional retrospective investigation was carried out in a hospital setting, mostly at a private dental college. Prior to the start of the trial, the Institutional Review Board granted ethical approval.

### *Inclusion criteria:*

This study incorporates the patients who answered to Saveetha Dental College with traumatic injuries such as avulsion, intrusion, extrusion and luxation of age group of 2-6 years.

### *Exclusion criteria:*

This study excludes the patients revealed with other dental complications, maxillofacial surgery with age groups other than 2-6 years.

### *Sampling technique:*

The study depended on the Random inspecting strategy. To limit the testing predisposition, every one of the cases was assessed already.

### *Data collection and Tabulation*

Information assortment was finished utilizing the patient data set with the time period of 1 January 2020 to February 2021. The information was received from DIAS (Dental Information Archiving Software), after appraisal in the college patient information register, case records of 40 patients clinically determined to have dental injuries were incorporated and assessed in the review. Cross check of the information was finished by the analyst. The assortment information was organized in view of the accompanying parameters:

1. Patient age
2. Patient gender
3. Patient chief complaint - Traumatic injuries

## **Statistical Analysis**

The data was entered into SPSS after the variables were coded. Categorical variables were reported in terms of numbers and bar graphs were generated using SPSS version 23. The Chi Square test was used to test the statistical analysis of the associations.

## Results

Among 40 children who were affected by dental trauma, 62.5% were males and 37.5% are females. For pedodontic patients of age group 2-6years who were affected by dental trauma, 15% patients are affected at 2years, 10% patients are affected at 3years, 5% patients are affected at 4years, and 20% patients are affected at 5years and 50% patients are affected at 6years. 40% children are affected by avulsion, 20% children are affected by intrusion, 20% children are affected by extrusion and 20% children are affected by luxation. As a total count males were higher in count of 23 patients when compared to females 17 patients.

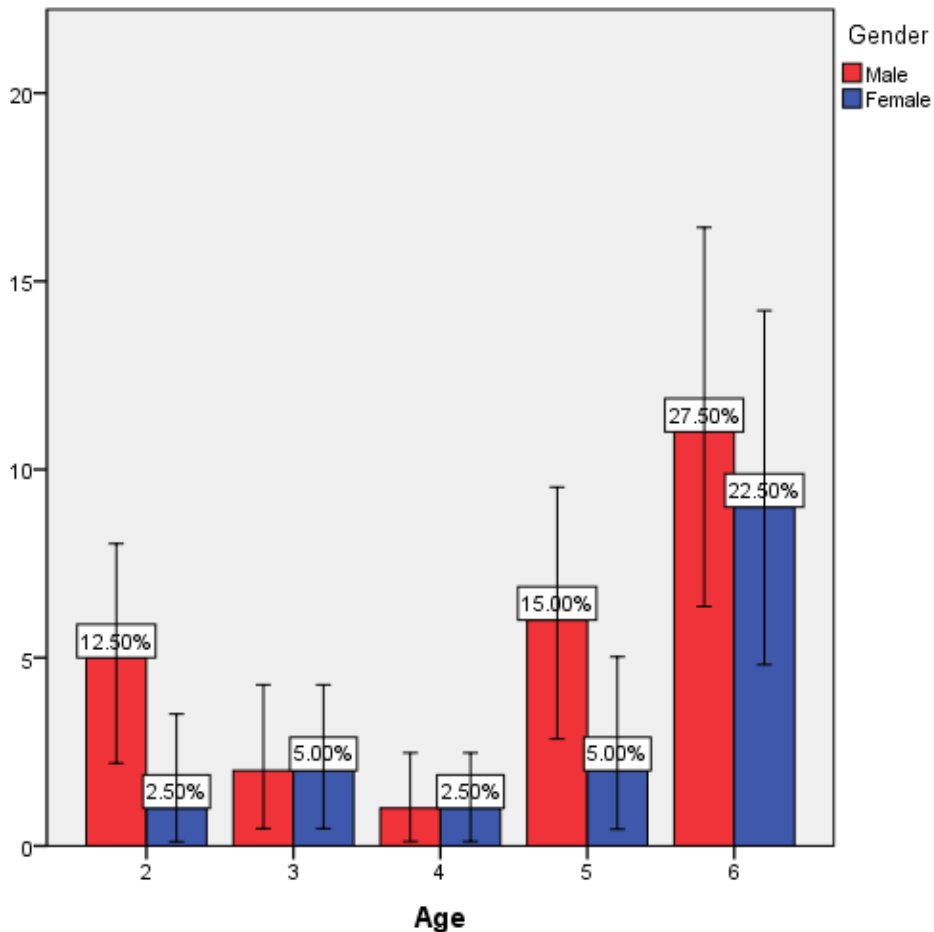


Figure 1: Association graph between age and gender

Figure 1: Bar represents the correlation between the age and gender of patients. X- axis represents the different ages and the Y- axis represents the number of patients. Red denotes male patients and blue denotes female patients. At 2 years 12.5% of males and 2.5% of female patients are affected by dental trauma, at 3 years 5% of males and 5% of female patients are affected by dental trauma, at 4 years 2.5% of males and 2.5% of female patients are affected by dental trauma

similarly at 5 years 15% of males and 5% of female patients are affected by dental trauma and at 6 years 27.5% of males and 22.5% of female patients are affected by dental trauma. Chi square test was done and association was not significant (p value- 0.640;  $p > 0.05$ ).

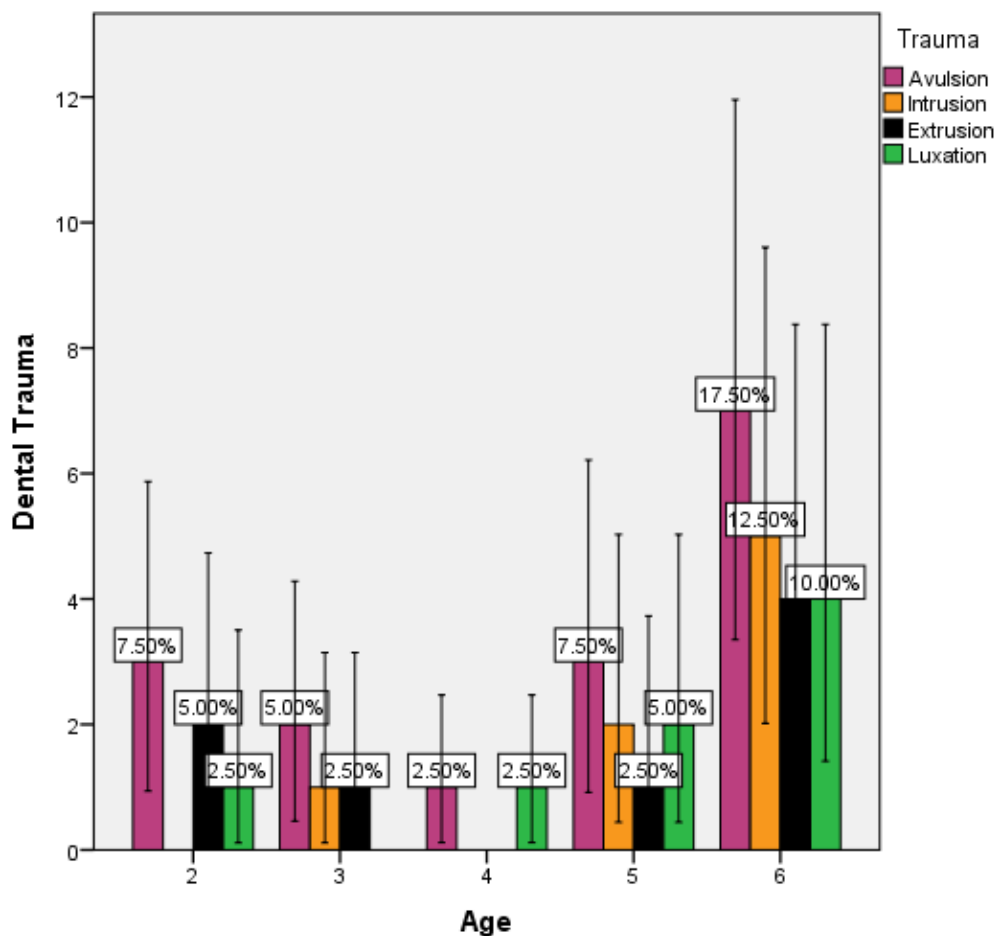


Figure 2 : Association graph between age and Dental trauma

Figure 2: Bar graph represents the correlation between age and types of dental trauma. The X- axis represents different ages and Y- axis represents types of dental trauma. Purple denotes avulsion, orange denotes intrusion, black denotes extrusion and green denotes luxation. At 2years 7.5% affected by avulsion, 5% affected by extrusion and 2.5% affected by luxation type of dental trauma. At 3years 5% affected by avulsion, 2.5% affected by extrusion and 2.5% affected by intrusion type of dental trauma. At 4years 2.5% are affected with avulsion and 2.5% affected by luxation type of dental trauma. At 5years 7.5% affected by avulsion, 5% affected by intrusion, 2.5% affected by extrusion and 5% affected by luxation type of dental trauma similarly at 6years 17.5% affected by avulsion, 12.5% affected by intrusion, 10% affected by extrusion and 10% affected by luxation type of dental trauma. Chi square test was done and association was not

significant (p value- 0.940;  $p > 0.05$ ).

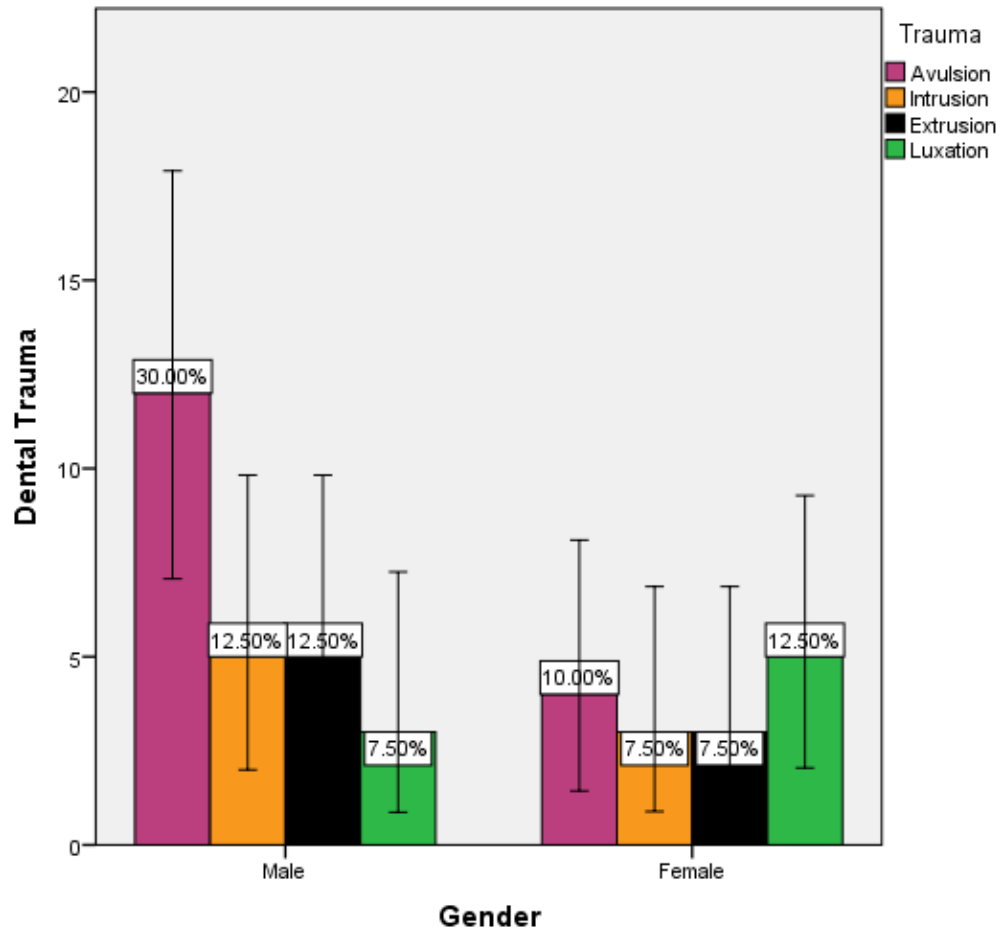


Figure 3: Association graph between gender and Dental trauma

Figure 3: Bar graph represents the correlation between gender and types of dental trauma. The X- axis represents gender and Y- axis represents types of dental trauma. Purple denotes avulsion, orange denotes intrusion, black denotes extrusion and green denotes luxation. In males 30% affected by avulsion, 12.5% affected by intrusion, 12.5% affected by extrusion and 7.5% affected by luxation and in females 10% affected by avulsion, 7.5% affected by intrusion, 7.5% affected by extrusion and 12.5% affected by luxation. Chi square test was done and association was not significant (p value- 0.362;  $p > 0.05$ ).

## **Discussion**

TDI range from minor cracks of the finish to significant harm including the uprooting or displacement of teeth. The predominance of dental injury in this young population was like those announced in public overviews in the US and UK(33). The relationship among injury and dental caries particularly shows the way that a subgroup of youngsters live in interior areas or are powerless to ways of behaving that place them at more serious risk of different oral issues(34).

Of all dental traumas that happen before 30 years, 50% happen before the age of 10 with the high count of being at 6 years(35). Anyway correlations between studies would be performed carefully because of the deficiency of consistency inside the examples, clinical symptomatic standards, area of the review, and age groups(11). Most common anterior dental injury in the current review population was 10.2%, which was in concordance with the investigations revealed before(36).

TDI is more common in males than females due to accidents in houses and schools(37). From the current study, males experienced essentially a more frequent dental injury contrasted with females. Gender might be a notable factor variable during which boys experience dental wounds more frequently as females. Therefore, different studies portray clashing reports with no sex inclination in essential teeth injury (37,38).

In the current study we noticed an indistinguishable pattern of break of the crown with full inclusion of enamel and avulsion is more common. A sensible proportion of studies have depicted that dental injury to the deciduous teeth often incorporates one tooth and a portion of the time exceptionally numerous teeth(5). Dental injuries happen more often in the maxilla than in the mandible, and the upper central incisors are the teeth generally regularly hurt. The explanation for this might be the ordinary security of the mandibular incisors together with the general obviousness of the maxillary central incisors(39).

At 3-5 years dental injuries are common, as children play more during the period. So they are more prevalent to dental injuries(11). Children inside the lower financial gatherings were fundamentally more prone to dental injuries(5). This study was led during a selected city. Future examinations ought to target randomizing the model with a more prominent gathering of children. This fundamental information is frequently utilized by wellbeing strategy creators to direct a public local area level overview at a later stage to carry out specific approaches.

## **Conclusion**

Based on the results obtained from the current study it can be concluded that, the prevalence of traumatic dental injuries to the primary anterior teeth is relatively high. Dental trauma is more prevalent among males than females and it has been shown that the age group at 6 years of patients has more incidence of avulsion and males were logical more inclined to dental injury than females.

### Acknowledgement

I would like to thank the Department of pedodontics, Saveetha Dental College and Hospitals, Saveetha Institute of Medical and Technical Science, Saveetha University, Chennai for their valuable inputs in this study.

### Conflicts Of Interest

The authors declare no conflict of interest

### Reference

1. Andreasen JO, Andreasen FM. Essentials of Traumatic Injuries to the Teeth: A Step-by-Step Treatment Guide. John Wiley & Sons; 2010. 192 p.
2. Berti GO, Hesse D, Bonifácio CC, Raggio DP, Bönecker MJS. Epidemiological study of traumatic dental injuries in 5- to 6-year-old Brazilian children. *Braz Oral Res.* 2015 Aug 21;29:1-6.
3. Chalissery V, Marwah N, Jafer M, Chalisserry E, Bhatt T, Anil S. Prevalence of anterior dental trauma and its associated factors among children aged 3-5 years in Jaipur City, India - A cross sectional study [Internet]. Vol. 6, *Journal of International Society of Preventive and Community Dentistry.* 2016. p. 35. Available from: <http://dx.doi.org/10.4103/2231-0762.181165>
4. ElKarmi RF, Hamdan MA, Rajab LD, Abu-Ghazaleh SB, Sonbol HN. Prevalence of traumatic dental injuries and associated factors among preschool children in Amman, Jordan [Internet]. Vol. 31, *Dental Traumatology.* 2015. p. 487-92. Available from: <http://dx.doi.org/10.1111/edt.12183>
5. Andreasen JO, Andreasen FM, Andersson L. Textbook and Color Atlas of Traumatic Injuries to the Teeth. John Wiley & Sons; 2018. 1064 p.
6. Altun C, Cehreli ZC, Güven G, Acikel C. Traumatic intrusion of primary teeth and its effects on the permanent successors: A clinical follow-up study [Internet]. Vol. 107, *Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology, and Endodontology.* 2009. p. 493-8. Available from: <http://dx.doi.org/10.1016/j.tripleo.2008.10.016>
7. Andreasen JO. Etiology and pathogenesis of traumatic dental injuries A clinical study of 1,298 cases [Internet]. Vol. 78, *European Journal of Oral Sciences.* 1970. p. 329-42. Available from: <http://dx.doi.org/10.1111/j.1600-0722.1970.tb02080.x>
8. Boorum MK, Andreasen JO. Sequelae of trauma to primary maxillary incisors. I. Complications in the primary dentition [Internet]. Vol. 14, *Dental Traumatology.* 1998. p. 31-44. Available from: <http://dx.doi.org/10.1111/j.1600-9657.1998.tb00806.x>
9. Borum MK, Andreasen JO. Therapeutic and economic implications of traumatic dental injuries in Denmark: an estimate based on 7549 patients treated at a major trauma centre [Internet]. Vol. 11, *International Journal of Paediatric Dentistry.* 2008. p. 249-58. Available from: <http://dx.doi.org/10.1046/j.1365-263x.2001.00277.x>
10. Patel MC, Sujana SG. The prevalence of traumatic dental injuries to permanent anterior teeth and its relation with predisposing risk factors among 8-13 years school children of Vadodara city: An epidemiological study [Internet]. Vol. 30, *Journal of Indian Society of Pedodontics and Preventive*

- Dentistry. 2012. p. 151. Available from: <http://dx.doi.org/10.4103/0970-4388.99992>
11. Andreasen JO, Bakland LK, Flores MT, Andreasen FM, Andersson L. Traumatic Dental Injuries: A Manual. John Wiley & Sons; 2011. 104 p.
  12. Fuks A, Peretz B. Pediatric Endodontics: Current Concepts in Pulp Therapy for Primary and Young Permanent Teeth. Springer; 2016. 164 p.
  13. Subramanyam D, Gurunathan D, Gaayathri R, Vishnu Priya V. Comparative evaluation of salivary malondialdehyde levels as a marker of lipid peroxidation in early childhood caries. *Eur J Dent.* 2018 Jan;12(1):67–70.
  14. Ramadurai N, Gurunathan D, Samuel AV, Subramanian E, Rodrigues SJL. Effectiveness of 2% Articaine as an anesthetic agent in children: randomized controlled trial. *Clin Oral Investig.* 2019 Sep;23(9):3543–50.
  15. Ramakrishnan M, Dhanalakshmi R, Subramanian EMG. Survival rate of different fixed posterior space maintainers used in Paediatric Dentistry – A systematic review [Internet]. Vol. 31, *The Saudi Dental Journal.* 2019. p. 165–72. Available from: <http://dx.doi.org/10.1016/j.sdentj.2019.02.037>
  16. Jeevanandan G, Thomas E. Volumetric analysis of hand, reciprocating and rotary instrumentation techniques in primary molars using spiral computed tomography: An in vitro comparative study. *Eur J Dent.* 2018 Jan;12(1):21–6.
  17. Princeton B, Santhakumar P, Prathap L. Awareness on Preventive Measures taken by Health Care Professionals Attending COVID-19 Patients among Dental Students. *Eur J Dent.* 2020 Dec;14(S 01):S105–9.
  18. Saravanakumar K, Park S, Mariadoss AVA, Sathiyaseelan A, Veeraraghavan VP, Kim S, et al. Chemical composition, antioxidant, and anti-diabetic activities of ethyl acetate fraction of *Stachys riedereri* var. *japonica* (Miq.) in streptozotocin-induced type 2 diabetic mice. *Food Chem Toxicol.* 2021 Jun 26;155:112374.
  19. Wei W, Li R, Liu Q, Devanathadesikan Seshadri V, Veeraraghavan VP, Surapaneni KM, et al. Amelioration of oxidative stress, inflammation and tumor promotion by Tin oxide-Sodium alginate-Polyethylene glycol-Allyl isothiocyanate nanocomposites on the 1,2-Dimethylhydrazine induced colon carcinogenesis in rats. *Arabian Journal of Chemistry.* 2021 Aug 1;14(8):103238.
  20. Gothandam K, Ganesan VS, Ayyasamy T, Ramalingam S. Antioxidant potential of theaflavin ameliorates the activities of key enzymes of glucose metabolism in high fat diet and streptozotocin - induced diabetic rats. *Redox Rep.* 2019 Dec;24(1):41–50.
  21. Su P, Veeraraghavan VP, Krishna Mohan S, Lu W. A ginger derivative, zingerone-a phenolic compound-induces ROS-mediated apoptosis in colon cancer cells (HCT-116). *J Biochem Mol Toxicol.* 2019 Dec;33(12):e22403.
  22. Mathew MG, Samuel SR, Soni AJ, Roopa KB. Evaluation of adhesion of *Streptococcus mutans*, plaque accumulation on zirconia and stainless steel crowns, and surrounding gingival inflammation in primary molars: randomized controlled trial [Internet]. Vol. 24, *Clinical Oral Investigations.* 2020. p. 3275–80. Available from: <http://dx.doi.org/10.1007/s00784-020-03204-9>
  23. Sekar D, Johnson J, Biruntha M, Lakhmanan G, Gurunathan D, Ross K. Biological and Clinical Relevance of microRNAs in Mitochondrial Diseases/Dysfunctions. *DNA Cell Biol.* 2020 Aug;39(8):1379–84.
  24. Velusamy R, Sakthinathan G, Vignesh R, Kumarasamy A, Sathishkumar D,

- Nithya Priya K, et al. Tribological and thermal characterization of electron beam physical vapor deposited single layer thin film for TBC application. *Surf Topogr: Metrol Prop.* 2021 Jun 24;9(2):025043.
25. Aldhuwayhi S, Mallineni SK, Sakhamuri S, Thakare AA, Mallineni S, Sajja R, et al. Covid-19 Knowledge and Perceptions Among Dental Specialists: A Cross-Sectional Online Questionnaire Survey. *Risk ManagHealthc Policy.* 2021 Jul 7;14:2851–61.
  26. Sekar D, Nallaswamy D, Lakshmanan G. Decoding the functional role of long noncoding RNAs (lncRNAs) in hypertension progression. *Hypertens Res.* 2020 Jul;43(7):724–5.
  27. Bai L, Li J, Panagal M, M B, Sekar D. Methylation dependent microRNA 1285-5p and sterol carrier proteins 2 in type 2 diabetes mellitus. *Artif Cells NanomedBiotechnol.* 2019 Dec;47(1):3417–22.
  28. Sekar D. Circular RNA: a new biomarker for different types of hypertension. *Hypertens Res.* 2019 Nov;42(11):1824–5.
  29. Sekar D, Mani P, Biruntha M, Sivagurunathan P, Karthigeyan M. Dissecting the functional role of microRNA 21 in osteosarcoma. *Cancer Gene Ther.* 2019 Jul;26(7-8):179–82.
  30. Duraisamy R, Krishnan CS, Ramasubramanian H, Sampathkumar J, Mariappan S, NavarasampattiSivaprakasam A. Compatibility of Nonoriginal Abutments With Implants: Evaluation of Microgap at the Implant-Abutment Interface, With Original and Nonoriginal Abutments. *Implant Dent.* 2019 Jun;28(3):289–95.
  31. Parimelazhagan R, Umapathy D, Sivakamasundari IR, Sethupathy S, Ali D, Kunka Mohanram R, et al. Association between Tumor Prognosis Marker Visfatin and Proinflammatory Cytokines in Hypertensive Patients. *Biomed Res Int.* 2021 Mar 16;2021:8568926.
  32. Syed MH, Gnanakkan A, Pitchiah S. Exploration of acute toxicity, analgesic, anti-inflammatory, and anti-pyretic activities of the black tunicate, *Phallusia nigra* (Savigny, 1816) using mice model. *Environ Sci Pollut Res Int.* 2021 Feb;28(5):5809–21.
  33. Uldum B, Hallonsten A-L, Poulsen S. Midazolam conscious sedation in a large Danish municipal dental service for children and adolescents [Internet]. Vol. 18, *International Journal of Paediatric Dentistry.* 2008. p. 256–61. Available from: <http://dx.doi.org/10.1111/j.1365-263x.2007.00902.x>
  34. Schuur A. *Pathology of the Hard Dental Tissues.* John Wiley & Sons; 2012. 456 p.
  35. Sorce L, Kline-Tilford A. Nursing in the Pediatric Intensive Care Unit [Internet]. Vol. 04, *Journal of Pediatric Intensive Care.* 2015. p. 055–055. Available from: <http://dx.doi.org/10.1055/s-0035-1556746>
  36. Ain TS, Lingasha RT, Sultan S, Tangade P, Telgi CR, Tirth A, et al. Prevalence of Traumatic Dental Injuries to Anterior Teeth of 12-Year-Old School Children in Kashmir, India [Internet]. Vol. 5, *Archives of Trauma Research.* 2016. Available from: <http://dx.doi.org/10.5812/at.24596>
  37. Lam R. Epidemiology and outcomes of traumatic dental injuries: a review of the literature [Internet]. Vol. 61, *Australian Dental Journal.* 2016. p. 4–20. Available from: <http://dx.doi.org/10.1111/adj.12395>
  38. Vuletić M, Škaričić J, Batinjan G, Trampuš Z, Bagić IČ, Jurić H. A retrospective study on traumatic dental and soft-tissue injuries in preschool children in Zagreb, Croatia [Internet]. Vol. 14, *Bosnian Journal of Basic*

- Medical Sciences. 2014. p. 12. Available from:  
<http://dx.doi.org/10.17305/bjbms.2014.2283>
39. Goettems ML, Brancher LC, da Costa CT, Bonow MLM, Romano AR. Does dental trauma in the primary dentition increases the likelihood of trauma in the permanent dentition? A longitudinal study [Internet]. Vol. 21, Clinical Oral Investigations. 2017. p. 2415-20. Available from:  
<http://dx.doi.org/10.1007/s00784-016-2037-3>