

Management of Children below 12 Years during Lockdown by Urban Parents of Chennai - A Survey

Thiru kumaran

Saveetha dental college and Hospitals,
Saveetha institute of medical and technical sciences(SIMATS),
Saveetha university, chennai.
Email id: 151901043.sdc@saveetha.com

R.Gayathri

Assistant Professor,Department of Biochemistry,
Saveetha dental College and Hospitals,
Saveetha Institute of medical and technical science(SIMATS),
Saveetha university, Chennai.
Email id: gayathri.sdc@saveetha.com

R.Gayatri Devi

Assistant Professor,Department of physiology,
Saveetha dental College and Hospitals,
Saveetha institute of medical and technical science(SIMATS),
Saveetha University,Chennai,
Email id: gayatridevi@saveetha.com

V.Vishnu Priya

Professor,Department of Biochemistry,
Saveetha dental College and Hospitals,
Saveetha Institute of medical and technical Sciences(SIMATS),
Saveetha university,
Chennai.
Email id: vishnupriya@saveetha.com.

Corresponding Author:

Dr.R.Gayathri

Assistant Professor,Department of Biochemistry,
Saveetha dental College and Hospitals,
Saveetha Institute of medical and technical science(SIMATS),
Saveetha university, Chennai.
Email id: gayathri.sdc@saveetha.com
Phone number:9710680545

ABSTRACT:

COVID-19, a pandemic outbreak originated from Wuhan, China , now has spread around 70 countries in the world. To prevent COVID-19 spread it is necessary to follow lockdown.While coronavirus continues to spread across the globe, many countries have decided to close schools as part of a social distancing policy in order to slow transmission of the virus.However, these

closure of schools, has affected the education children and youth worldwide due to the coronavirus (COVID-19) pandemic. Lockdown is the term which is new to everyone, especially the young children. To make them understand and control them and maintain a good routine is a task. Controlling children during lockdown is bit difficult but there are many ways to keep them energetic and joyful. The aim of this survey was to assess the awareness of urban parents of Chennai to manage their kids amidst the lockdown. An online survey with self structured questionnaire to analyse the methods followed by parents to control their childrens below 12 years in this COVID-19 pandemic was done. The results were obtained and statistically analysed through SPSS software, chi square test was done to check the association and a p value of <0.05 was said to be statistically significant. The survey was conducted in the month of May, 2020. From the survey, it was evident that 46% of the parents found it difficult to manage their children and 95% of them were worried that their children's education will be affected by the delay in lifting down the corona virus lockdown. At the same time 54% of the participants took this lockdown as an opportunity to teach them arts and crafts and also found that the majority of the female participants were more interested to teach their kinds than male participants and it is statistically significant. ($p\text{-value} < 0.05$).

Keywords: Covid-19, lockdown, parents, children, Screen time, online games

INTRODUCTION:

COVID-19 pandemic outbreak originated from Wuhan, China which has spread around 70 countries and it is the first non-severe acute respiratory syndrome epidemic. The important measures taken to control the COVID-19 spread is lockdown, but it is difficult to follow for many people and it is especially very difficult for the parents to manage their children during this lock down (Kumar *et al.*, no date; Kalra, Kalra and Kumar, 2020). Children will never stay still in a place but this lockdown trapped them inside the house which makes them bored and inactive. The main role of parents is to make them cheer and happy and not let them get depressed. There are many ways to make them active and cheerful (Chen *et al.*, 2019). Many parents never got the chance to spend time with their children due to work, but this lock down is a good opportunity for them to spend more time with them and understand their needs clearly ((Kumar *et al.*, no date; Castaldi *et al.*, 2020). The lockdown amidst the coronavirus outbreak has been especially tough on teens and parents, across the world. In London, instances being reported of rebellious teens going outside homes breaking the coronavirus lockdown rules, the Police Federation came up with the idea of fining parents if their teen children refuse to follow the rules ((Lamba, 2020). In India, the police departments are not taking any serious measures, they are just counselling them without any fine or punishment. With schools and colleges shut, teens are spending most of their time at home and parents say that they are finding it quite challenging to keep them indoors (Ray and Subramanian, 2020). Make them do any work and keep them active, always teach them moral values, interact with them and don't let them watch TV for a long time or any other channels like YouTube instead of that make them read books which helps them to grow their knowledge and share your daily chores which encourages them. Make them do meditation and yoga daily Which helps their mind to be calm, clear and cook their favourite dishes which makes them happy. The educational systems globally is affected due to COVID-19 pandemic, leading to the near-total closures of schools, universities and colleges (Wu *et al.*, 2019), (Ke *et al.*, 2019).

Governments all over the world have closed educational institutions which are taken as a measure to control the spread of COVID-19. As of 24 May 2020, approximately 1.725 billion learners are affected currently due to this school closure is the response to the pandemic (Ma *et al.*, 2019). According to UNICEF monitoring, more than 153 countries have implemented national closures and 24 have implemented local closures, impacting about 98.6 percent of the global student population (Mohan, Veeraraghavan and Jainu, 2015). School closures impact not only students, teachers, and families. but have far-reaching economic and societal consequences (Li *et al.*, 2020). School closures in response to the pandemic have shed light on various social and economic issues, including student debt,digital learning,food insecurity,and homelessness,as well as access to childcare, healthcare, housing, internet and disability services (Menon, Priya and Gayathri, 2016)

Over the past decade there has been numerous research on cancer biology(Priya, Jainu and Mohan, 2018), nanotechnology (Wang *et al.*, 2019)cytotoxicity analysis(Gan *et al.*, 2019) various in vivo researches(Ramya, Vishnu Priya and Gayathri, 2018; Rengasamy *et al.*, 2018).testing and evaluating the goodness of various natural food substituents(Shukri *et al.*, 2016)All these researches are very much important to mankind(Rengasamy *et al.*, 2016; Ponnulakshmi *et al.*, 2019).But this survey is no way related to any of the high end researches instead it concentrates on the current situation.The aim of this survey is to assess the awareness of urban parents of Chennai to manage their kids below 12 years amidst the lockdown.

Our team has rich experience in research and we have collaborated with numerous authors over various topics in the past decade (Ariga *et al.*, 2018; Basha, Ganapathy and Venugopalan, 2018; Hannah *et al.*, 2018; Hussainy *et al.*, 2018; Jeevanandan and Govindaraju, 2018; Kannan and Venugopalan, 2018; Kumar and Antony, 2018; Manohar and Sharma, 2018; Menon *et al.*, 2018; Nandakumar and Nasim, 2018; Nandhini, Babu and Mohanraj, 2018; Ravinthar and Jayalakshmi, 2018; Seppan *et al.*, 2018; Teja, Ramesh and Priya, 2018; Duraisamy *et al.*, 2019; Gheena and Ezhilarasan, 2019; Hema Shree *et al.*, 2019; Rajakeerthi and Ms, 2019; Rajendran *et al.*, 2019; Sekar *et al.*, 2019; Sharma *et al.*, 2019; Siddique *et al.*, 2019; Janani, Palanivelu and Sandhya, 2020; Johnson *et al.*, 2020; Jose, Ajitha and Subbaiyan, 2020).

MATERIALS AND METHOD:

Study Design

A survey was conducted among urban parents of children below 12 years old, who belong to Chennai, to evaluate their knowledge and awareness to manage their children during lockdown. The sample size of the study was 100. Ethical approval and informed consent from the participants were obtained. The study was conducted in the month of May, 2020.

Survey Instrument

The survey instrument which was a questionnaire was prepared after extensive review of the existing literature. The questionnaire was reviewed and amendments were made to improve the clarity of the questions to eliminate ambiguous responses. The questionnaire consisted a total of

12 questions. The questionnaire was shared to parents of children who were below 12 years old belonging to Chennai, using online survey platform.

Data Analysis

Only completed surveys were taken for analysis and the incompleting surveys were eliminated. The statistical test used is descriptive statistics. All the responses obtained were tabulated and reliability of the data was checked. The statistics done using SPSS software, Chi-square test was done to check the association and a p value of 0.05 was said to be statistically significant.

RESULTS AND DISCUSSION:

From the survey results, it was evident that the Indian parents try to manage their lockdown period effectively with their kids. Getting involved in daily chores not only make their children more bonded to them, but also make them understand the pains and the reality of the world. When asked the study participants based on their opinion in managing children during lockdown, where 46% of the participants find it difficult to manage their children and 54% of them do not feel the same (Figure 1). When asked about the participants based on their opinion to make the children aware of the current lockdown, where 95% of parents were able explain the current situation to their children and 5% were not able to explain (Figure 2). Explaining the reason behind lockdown and social distancing is very important to the children who are less than 12 years old. To this view 100% of the male participants were strong enough to share their thoughts to their kids, this gives a better understanding of dos and don'ts for the children. Our institution is passionate about high quality evidence based research and has excelled in various fields ((Pc, Marimuthu and Devadoss, 2018; Ramesh *et al.*, 2018; Vijayashree Priyadharsini, Smiline Girija and Paramasivam, 2018; Ezhilarasan, Apoorva and Ashok Vardhan, 2019; Ramadurai *et al.*, 2019; Sridharan *et al.*, 2019; Vijayashree Priyadharsini, 2019; Chandrasekar *et al.*, 2020; Mathew *et al.*, 2020; R *et al.*, 2020; Samuel, 2021)

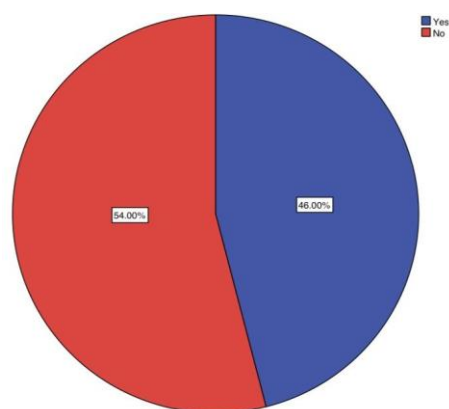


Figure 1: Pie chart representing the distribution of participants based on their opinion in managing children during lockdown, where 46% of the participants (blue) find it difficult to manage and 54% (red) do not feel the same.

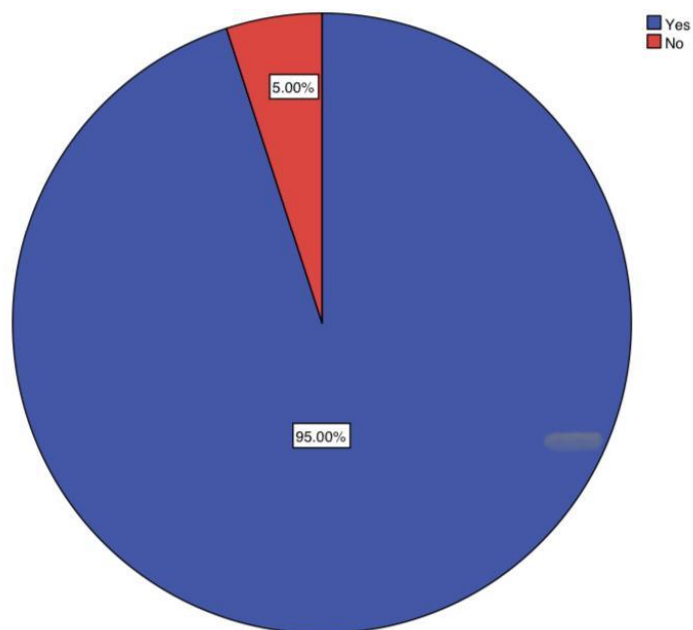


Figure 2: Pie chart represents the distribution of participants based on their opinion to make their children aware of the current lockdown, where 95% of parents(blue) were able explain the current situation to their children and 5%(red) were not able to explain.

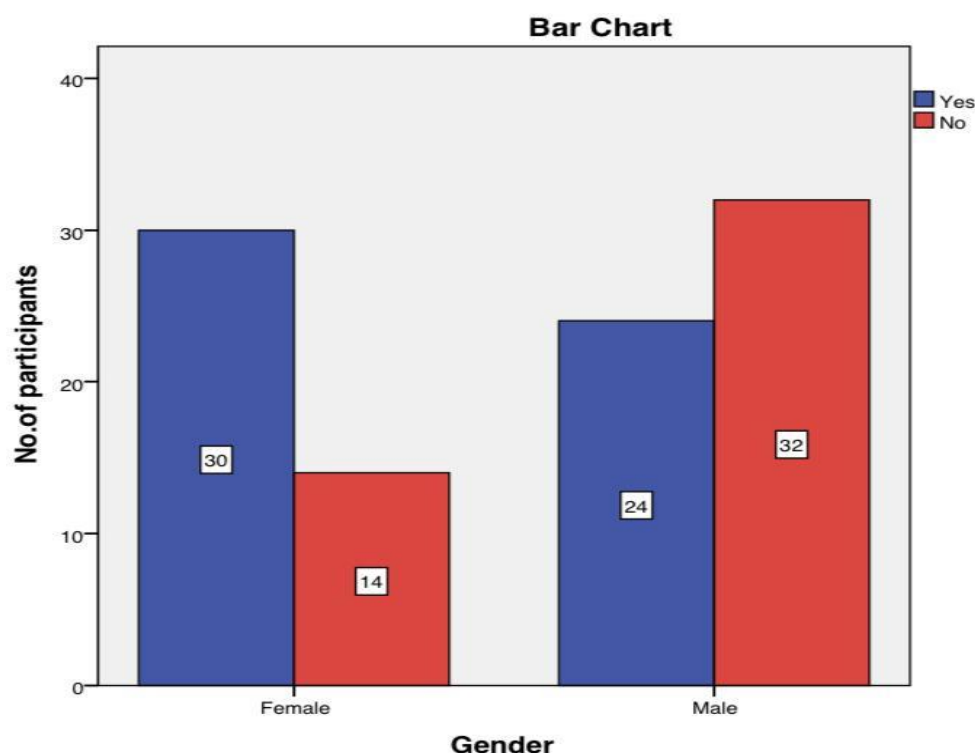


Figure 3: Bar graph representing association between gender and the opinion of the parents to take this time as an opportunity to teach them arts and crafts. X axis represents the gender and Y axis represents the opinion of the participants regarding teaching their children below 12 years. Majority of female participants wanted to teach their children arts and crafts during lockdown

than the male participants, and it is statistically significant. Chi-square test, Pearson chi square value-27.083, DF-1, p value=0.00(<0.05) hence it is statistically significant.

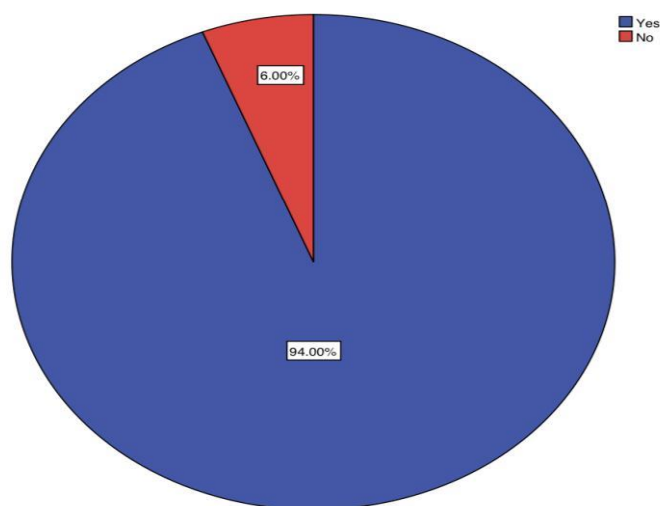


Figure 4: Pie chart represents the distribution of participants based on their opinion to make their children share the daily chores with them, where 94% (blue) of the parents had made their children to share their daily chores and 6% (red) have not done the same.

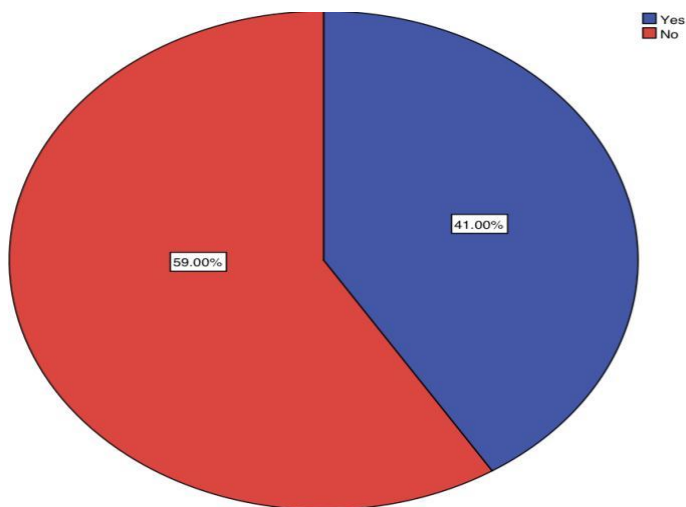


Figure 5: Pie chart represents the distribution of participants based on their opinion on the waking up time of their children, where 41% of the participant had children who were waking up late (blue) and 59% (red) of the participant had children who woke up early, during this lockdown.

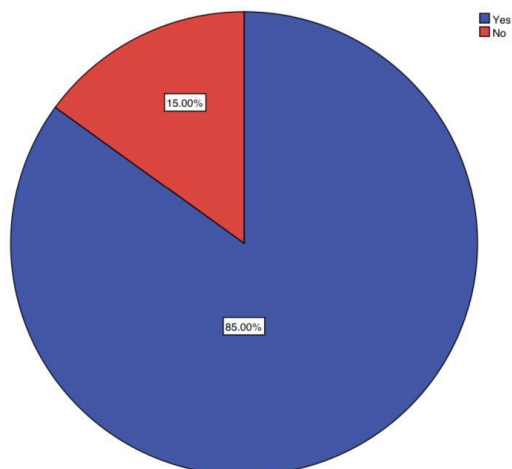


Figure 6: Pie chart represents the distribution of participants based on their opinion on their children's education, where 95% (blue) of the parents are worried about their children's education and 15% (red) have no worries about their children's education .

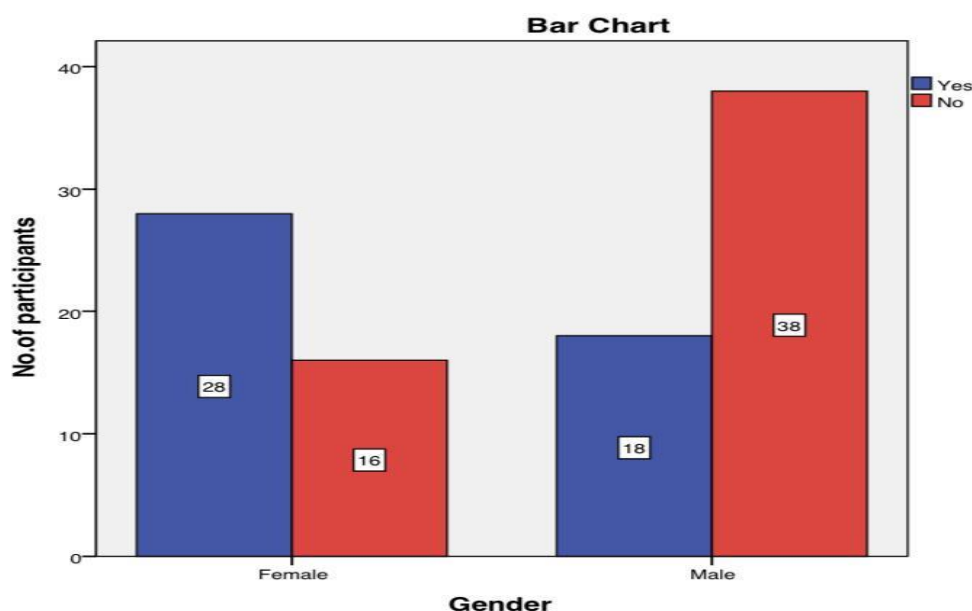


Figure 7: Bar graph representing association between gender and their opinion on managing children below 12 years during lockdown. X axis represents gender and Y axis represents the opinion of the study participants on handling their children. Majority of females were confident of managing their children amidst lockdown than males and it is statistically significant. Chi-square test, Pearson Chi-square value-5.702, DF-1, $p=0.017(<0.05)$, hence statistically significant.

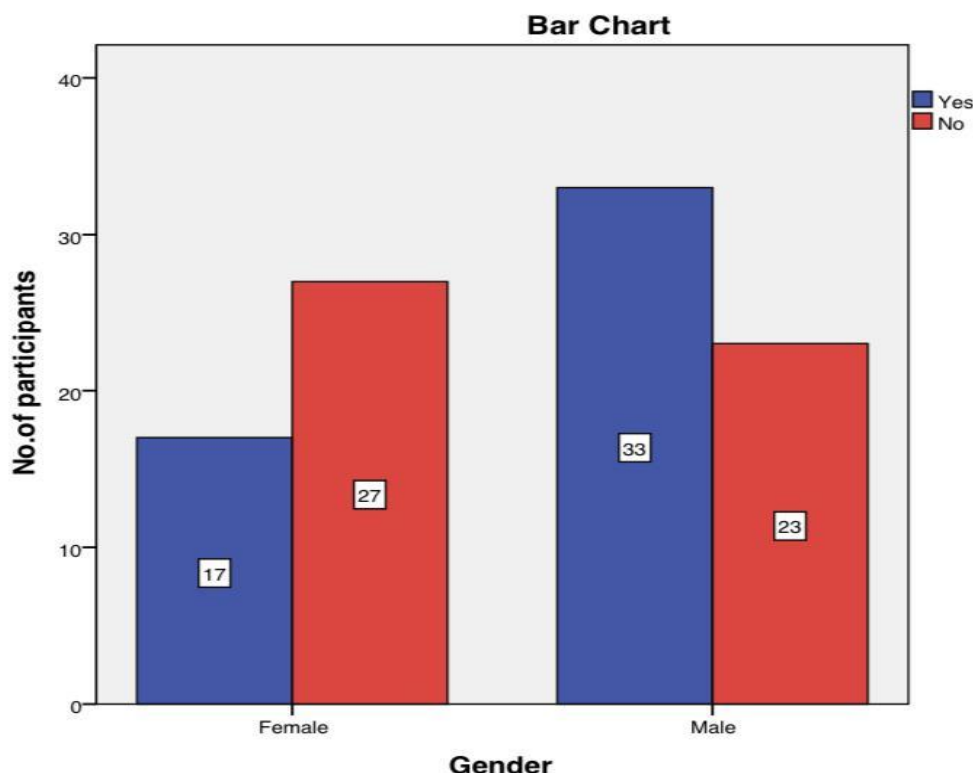


Figure 8: Bar graph representing association between gender and the opinion of parents on the amount of time spent by their children online. X axis represents the gender and Y axis represents the opinion of study participants on the time spent by their children online. Majority Of males, think that their children spend lots of time on online games than the female participants, however it is statistically not significant..Chi-square test, Pearson Chi- square value -0.624, DF-1, p= Value 0.430(>0.05) hence statistically not significant.

CONCLUSION:

From the survey, it was evident that 46% of the urban parents found it difficult to manage their children below 12 years of age and 95% of them were worried that their children's education will be affected by the delay in lifting down the corona virus lockdown. At the same time 54% of the participants took this lockdown as an opportunity to teach their children arts, crafts and moral education. It was also found that the majority of the urban female participants were more interested to teach their kids than male participants and it was statistically significant.

REFERENCES:

1. Ariga, P. *et al.* (2018) 'Determination of correlation of width of Maxillary Anterior Teeth using Extraoral and Intraoral Factors in Indian Population: A systematic review', *World journal of dentistry*, 9(1), pp. 68–75.
2. Basha, F. Y. S., Ganapathy, D. and Venugopalan, S. (2018) 'Oral hygiene status among pregnant women', *Journal of advanced pharmaceutical technology & research*, 11(7), p.

3099.

3. Castaldi, S. *et al.* (2020) 'COVID-19: the end of lockdown what next?', *Acta bio-medica: Atenei Parmensis*, 91(2), pp. 236–238.
4. Chandrasekar, R. *et al.* (2020) 'Development and validation of a formula for objective assessment of cervical vertebral bone age', *Progress in orthodontics*, 21(1), p. 38.
5. Chen, F. *et al.* (2019) '6-shogaol, a active constituents of ginger prevents UVB radiation mediated inflammation and oxidative stress through modulating NrF2 signaling in human epidermal keratinocytes (HaCaT cells)', *Journal of photochemistry and photobiology. B, Biology*, 197, p. 111518.
6. Duraisamy, R. *et al.* (2019) 'Compatibility of Nonoriginal Abutments With Implants: Evaluation of Microgap at the Implant-Abutment Interface, With Original and Nonoriginal Abutments', *Implant dentistry*, 28(3), pp. 289–295.
7. Ezhilarasan, D., Apoorva, V. S. and Ashok Vardhan, N. (2019) 'Syzygium cumini extract induced reactive oxygen species-mediated apoptosis in human oral squamous carcinoma cells', *Journal of oral pathology & medicine: official publication of the International Association of Oral Pathologists and the American Academy of Oral Pathology*, 48(2), pp. 115–121.
8. Gan, H. *et al.* (2019) 'Zingerone induced caspase-dependent apoptosis in MCF-7 cells and prevents 7,12-dimethylbenz(a)anthracene-induced mammary carcinogenesis in experimental rats', *Journal of biochemical and molecular toxicology*, 33(10), p. e22387.
9. Gheena, S. and Ezhilarasan, D. (2019) 'Syringic acid triggers reactive oxygen species-mediated cytotoxicity in HepG2 cells', *Human & experimental toxicology*, 38(6), pp. 694–702.
10. Hannah, R. *et al.* (2018) 'Awareness about the use, ethics and scope of dental photography among undergraduate dental students dentist behind the lens', *Journal of advanced pharmaceutical technology & research*, 11(3), p. 1012.
11. Hema Shree, K. *et al.* (2019) 'Saliva as a Diagnostic Tool in Oral Squamous Cell Carcinoma - a Systematic Review with Meta Analysis', *Pathology oncology research: POR*, 25(2), pp. 447–453.
12. Hussainy, S. N. *et al.* (2018) 'Clinical performance of resin-modified glass ionomer cement, flowable composite, and polyacid-modified resin composite in noncarious cervical lesions: One-year follow-up', *Journal of conservative dentistry: JCD*, 21(5), pp. 510–515.
13. Janani, K., Palanivelu, A. and Sandhya, R. (2020) 'Diagnostic accuracy of dental pulse oximeter with customized sensor holder, thermal test and electric pulp test for the evaluation of pulp vitality: an in vivo study', *Brazilian dental science*, 23(1). doi: 10.14295/bds.2020.v23i1.1805.

14. Jeevanandan, G. and Govindaraju, L. (2018) 'Clinical comparison of Kedo-S paediatric rotary files vs manual instrumentation for root canal preparation in primary molars: a double blinded randomised clinical trial', *European archives of paediatric dentistry: official journal of the European Academy of Paediatric Dentistry*, 19(4), pp. 273–278.
15. Johnson, J. *et al.* (2020) 'Computational identification of MiRNA-7110 from pulmonary arterial hypertension (PAH) ESTs: a new microRNA that links diabetes and PAH', *Hypertension research: official journal of the Japanese Society of Hypertension*, 43(4), pp. 360–362.
16. Jose, J., Ajitha and Subbaiyan, H. (2020) 'Different treatment modalities followed by dental practitioners for Ellis class 2 fracture – A questionnaire-based survey', *The open dentistry journal*, 14(1), pp. 59–65.
17. Kalra, S. K., Kalra, V. and Kumar, R. (2020) 'Corona Lockdown to Locked in Syndrome: A Neurosurgeon's Perspective', *Indian Journal of Neurosurgery*. doi: 10.1055/s-0040-1712185.
18. Kannan, A. and Venugopalan, S. (2018) 'A systematic review on the effect of use of impregnated retraction cords on gingiva', *Journal of advanced pharmaceutical technology & research*, 11(5), p. 2121.
19. Ke, Y. *et al.* (2019) 'Photosynthesized gold nanoparticles from *Catharanthus roseus* induces caspase-mediated apoptosis in cervical cancer cells (HeLa)', *Artificial cells, nanomedicine, and biotechnology*, 47(1), pp. 1938–1946.
20. Kumar, D. and Antony, S. D. P. (2018) 'Calcified canal and negotiation-A review', *Journal of advanced pharmaceutical technology & research*, 11(8), p. 3727.
21. Kumar, S. *et al.* (no date) 'Environmental Impact of Corona Virus (COVID-19) and Nationwide Lockdown in India: An Alarm to Future Lockdown Strategies'. doi: 10.20944/preprints202005.0403.v1.
22. Lamba, I. (2020) 'Why India needs to extend the nationwide lockdown', *The American journal of emergency medicine*. doi: 10.1016/j.ajem.2020.04.026.
23. Li, Z. *et al.* (2020) 'Apoptotic induction and anti-metastatic activity of eugenol encapsulated chitosan nanopolymer on rat glioma C6 cells via alleviating the MMP signaling pathway', *Journal of photochemistry and photobiology. B, Biology*, 203, p. 111773.
24. Manohar, M. P. and Sharma, S. (2018) 'A survey of the knowledge, attitude, and awareness about the principal choice of intracanal medicaments among the general dental practitioners and nonendodontic specialists', *Indian journal of dental research: official publication of Indian Society for Dental Research*, 29(6), pp. 716–720.
25. Mathew, M. G. *et al.* (2020) 'Evaluation of adhesion of *Streptococcus mutans*, plaque accumulation on zirconia and stainless steel crowns, and surrounding gingival inflammation in primary molars: Randomized controlled trial', *Clinical oral*

investigations, pp. 1–6.

26. Ma, Y. *et al.* (2019) ‘Sesame Inhibits Cell Proliferation and Induces Apoptosis through Inhibition of STAT-3 Translocation in Thyroid Cancer Cell Lines (FTC-133)’, *Biotechnology and Bioprocess Engineering*, pp. 646–652. doi: 10.1007/s12257-019-0151-1.
27. Menon, A., Priya, V., V. and Gayathri, R. (2016) ‘PRELIMINARY PHYTOCHEMICAL ANALYSIS AND CYTOTOXICITY POTENTIAL OF PINEAPPLE EXTRACT ON ORAL CANCER CELL LINES’, *Asian Journal of Pharmaceutical and Clinical Research*, p. 140.
28. Menon, S. *et al.* (2018) ‘Selenium nanoparticles: A potent chemotherapeutic agent and an elucidation of its mechanism’, *Colloids and surfaces. B, Biointerfaces*, 170, pp. 280–292.
29. Mohan, S. K., Veeraraghavan, V. P. and Jainu, M. (2015) ‘Effect of pioglitazone, quercetin, and hydroxy citric acid on vascular endothelial growth factor messenger RNA (VEGF mRNA) expression in experimentally induced nonalcoholic steatohepatitis (NASH)’, *TURKISH JOURNAL OF MEDICAL SCIENCES*, pp. 542–546. doi: 10.3906/sag-1404-136.
30. Nandakumar, M. and Nasim, I. (2018) ‘Comparative evaluation of grape seed and cranberry extracts in preventing enamel erosion: An optical emission spectrometric analysis’, *Journal of conservative dentistry: JCD*, 21(5), pp. 516–520.
31. Nandhini, J. S. T., Babu, K. Y. and Mohanraj, K. G. (2018) ‘Size, shape, prominence and localization of gerdy’s tubercle in dry human tibial bones’, *Journal of advanced pharmaceutical technology & research*, 11(8), p. 3604.
32. Pc, J., Marimuthu, T. and Devadoss, P. (2018) ‘Prevalence and measurement of anterior loop of the mandibular canal using CBCT: A cross sectional study’, *Clinical implant dentistry and related research*. Available at: <https://europepmc.org/article/med/29624863>.
33. Ponnulakshmi, R. *et al.* (2019) ‘In silico and in vivo analysis to identify the antidiabetic activity of beta sitosterol in adipose tissue of high fat diet and sucrose induced type-2 diabetic experimental rats’, *Toxicology mechanisms and methods*, 29(4), pp. 276–290.
34. Priya, V. V., Jainu, M. and Mohan, S. K. (2018) ‘Biochemical Evidence for the Antitumor Potential of Linn. On Diethylnitrosamine-Induced Hepatic Carcinoma’, *Pharmacognosy magazine*, 14(54), pp. 186–190.
35. Rajakeerthi and Ms, N. (2019) ‘Natural Product as the Storage medium for an avulsed tooth – A Systematic Review’, *Cumhuriyet Üniversitesi Diş Hekimliği Fakültesi dergisi*, 22(2), pp. 249–256.
36. Rajendran, R. *et al.* (2019) ‘Comparative evaluation of remineralizing potential of a paste containing bioactive glass and a topical cream containing casein phosphopeptide-amorphous calcium phosphate: An in vitro study’, *Pesquisa brasileira em*

odontopediatria e clinica integrata, 19(1), pp. 1–10.

37. Ramadurai, N. *et al.* (2019) 'Effectiveness of 2% Articaine as an anesthetic agent in children: randomized controlled trial', *Clinical oral investigations*, 23(9), pp. 3543–3550.
38. Ramesh, A. *et al.* (2018) 'Comparative estimation of sulfiredoxin levels between chronic periodontitis and healthy patients - A case-control study', *Journal of periodontology*, 89(10), pp. 1241–1248.
39. Ramya, G., Vishnu Priya, V. and Gayathri, R. (2018) 'CYTOTOXICITY OF STRAWBERRY EXTRACT ON ORAL CANCER CELL LINE', *Asian Journal of Pharmaceutical and Clinical Research*, 11(9), p. 353.
40. Ravinthar, K. and Jayalakshmi (2018) 'Recent advancements in laminates and veneers in dentistry', *Journal of advanced pharmaceutical technology & research*, 11(2), p. 785.
41. Ray, D. and Subramanian, S. (2020) 'India's Lockdown: An Interim Report'. doi: 10.3386/w27282.
42. Rengasamy, G. *et al.* (2016) 'Characterization, Partial Purification of Alkaline Protease from Intestinal Waste of Scomberomorus Guttatus and Production of Laundry Detergent with Alkaline Protease Additive', *INDIAN JOURNAL OF PHARMACEUTICAL EDUCATION AND RESEARCH*, 50(2), pp. S59–S67.
43. Rengasamy, G. *et al.* (2018) 'Cytotoxic and apoptotic potential of Myristica fragrans Houtt. (mace) extract on human oral epidermal carcinoma KB cell lines', *Brazilian Journal of Pharmaceutical Sciences*. doi: 10.1590/s2175-97902018000318028.
44. R, H. *et al.* (2020) 'CYP2 C9 polymorphism among patients with oral squamous cell carcinoma and its role in altering the metabolism of benzo[a]pyrene', *Oral Surgery, Oral Medicine, Oral Pathology and Oral Radiology*, pp. 306–312. doi: 10.1016/j.oooo.2020.06.021.
45. Samuel, S. R. (2021) 'Can 5-year-olds sensibly self-report the impact of developmental enamel defects on their quality of life?', *International journal of paediatric dentistry / the British Paedodontic Society [and] the International Association of Dentistry for Children*, 31(2), pp. 285–286.
46. Sekar, D. *et al.* (2019) 'Methylation-dependent circulating microRNA 510 in preeclampsia patients', *Hypertension research: official journal of the Japanese Society of Hypertension*, 42(10), pp. 1647–1648.
47. Seppan, P. *et al.* (2018) 'Therapeutic potential of Mucuna pruriens (Linn.) on ageing induced damage in dorsal nerve of the penis and its implication on erectile function: an experimental study using albino rats', *The aging male: the official journal of the International Society for the Study of the Aging Male*, pp. 1–14.
48. Sharma, P. *et al.* (2019) 'Emerging trends in the novel drug delivery approaches for the treatment of lung cancer', *Chemico-biological interactions*, 309, p. 108720.

49. Shukri, N. M. M. *et al.* (2016) 'Awareness in childhood obesity', *Research Journal of Pharmacy and Technology*, p. 1658. doi: 10.5958/0974-360x.2016.00334.6.
50. Siddique, R. *et al.* (2019) 'Qualitative and quantitative analysis of precipitate formation following interaction of chlorhexidine with sodium hypochlorite, neem, and tulsi', *Journal of conservative dentistry: JCD*, 22(1), pp. 40–47.
51. Sridharan, G. *et al.* (2019) 'Evaluation of salivary metabolomics in oral leukoplakia and oral squamous cell carcinoma', *Journal of oral pathology & medicine: official publication of the International Association of Oral Pathologists and the American Academy of Oral Pathology*, 48(4), pp. 299–306.
52. Teja, K. V., Ramesh, S. and Priya, V. (2018) 'Regulation of matrix metalloproteinase-3 gene expression in inflammation: A molecular study', *Journal of conservative dentistry: JCD*, 21(6), pp. 592–596.
53. Vijayashree Priyadharsini, J. (2019) 'In silico validation of the non-antibiotic drugs acetaminophen and ibuprofen as antibacterial agents against red complex pathogens', *Journal of periodontology*, 90(12), pp. 1441–1448.
54. Vijayashree Priyadharsini, J., Smiline Girija, A. S. and Paramasivam, A. (2018) 'In silico analysis of virulence genes in an emerging dental pathogen *A. baumannii* and related species', *Archives of oral biology*, 94, pp. 93–98.
55. Wang, Y. *et al.* (2019) 'Synthesis of Zinc oxide nanoparticles from *Marsdenia tenacissima* inhibits the cell proliferation and induces apoptosis in laryngeal cancer cells (Hep-2)', *Journal of Photochemistry and Photobiology B: Biology*, p. 111624. doi: 10.1016/j.jphotobiol.2019.111624.
56. Wu, F. *et al.* (2019) 'Biologically synthesized green gold nanoparticles from induce growth-inhibitory effect on melanoma cells (B16)', *Artificial cells, nanomedicine, and biotechnology*, 47(1), pp. 3297–3305.