



# **Knowledge and Awareness about the Connection between Lifestyle and Dementia among Adolescents**

**Dev Arora<sup>1</sup>, R. Gayatri Devi<sup>2\*</sup> and A. Jothi Priya<sup>2</sup>**

<sup>1</sup>Saveetha Dental College, Saveetha Institute of Medical and Technical Science (SIMATS), Saveetha University, Chennai, India.

<sup>2</sup>Department of Physiology, Saveetha Dental College, Saveetha Institute of Medical and Technical Science (SIMATS), Saveetha University, Chennai, India.

## **Authors' contributions**

*This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.*

## **Article Information**

DOI: 10.9734/JPRI/2021/v33i47B33130

Editor(s):

(1) Dr. Aurora Martínez Romero, Juarez University, Mexico.

Reviewers:

(1) Ghada Abd Alrhman Taqa, College of Dentistry, Iraq.

(2) Patsaraporn Somboonsak, Chandrakasem Rajabhat University, Thailand.

Complete Peer review History: <https://www.sdiarticle4.com/review-history/74339>

**Original Research Article**

**Received 02 August 2021**  
**Accepted 08 October 2021**  
**Published 03 November 2021**

## **ABSTRACT**

**Background and Aim:** Dementia is a group of symptoms characterized by memory loss, judgemental loss, forgetfulness. Dementia cannot be cured; but can be prevented. There are seven stages of Dementia, no cognitive decline being the first stage to very severe cognitive decline being the seventh stage. Healthy lifestyle is important for lower risk of Dementia. Smoking, consumption of alcohol, negative thinking, depression, stress, anxiety, lack of sleep, unhealthy diet causes Dementia. Diet plays a very important role in prevention of dementia; foods such as red meat, sugar, fatty foods can increase the risk of dementia whereas foods rich in fibres, fruits can reduce the risk of Dementia. The main aim of this study is to assess the knowledge about lifestyle and dementia.

**Materials and Methods:** This is a cross sectional survey. 121 adolescents of Saveetha Dental College, Chennai participated in the survey which was conducted through Google forms in February 2021. The questionnaire consisted of 19 questions. The data was analyzed with the help of SPSS software and chi-square test was done for the correlation between gender and awareness. Chi-square test was done for the correlation of gender with awareness among the population. 'p-value' was calculated and value < 0.05 was considered as significant.

**Results:** Out of that 62 were females and 59 were males. Females were more aware about healthy lifestyles and its connection with dementia than males. 92.56% of people were aware that physical activity promotes a healthy brain. 69.2% agreed that depression can increase risk of Dementia. Majority of them agreed that physical exercise can promote a healthy brain.

**Conclusion:** This study revealed that lifestyle is highly associated with dementia among adolescents. Healthy lifestyle leads to lower risk of dementia even if there's high genetic risk. Females were aware about the diet which is healthy for lower risk of dementia and more smoking affects the memory. However, most of the people were neutral about the relation between BMI and Dementia.

*Keywords: Dementia; lifestyle; adolescents; forgetfulness; cognition; health; innovation.*

## 1. INTRODUCTION

Dementia is a group of conditions characterized by memory loss, judgmental loss, forgetfulness. Symptoms include limited social skills, limited thinking abilities. There are seven stages of Dementia, no cognitive decline being the first stage to very severe cognitive decline being the seventh stage. The most common cause of dementia is Alzheimer's disease. Various treatments are there, but the condition cannot be cured. Chronic dementia may last for many years or may last lifelong.

Physical activity reduces the pathophysiology of dementia [1,2-4]. Diet plays a very important role in prevention of dementia; foods such as red meat, sugar, fatty foods can increase the risk of dementia whereas foods rich in fibres, fruits can reduce the risk of Dementia [5]. Change in lifestyle leads to low risk of Dementia even when there's high genetic risk. There are many studies regarding the correlation between Lifestyle and Dementia but there's still need for some guidelines. It is calculated that the number of people diagnosed with Dementia will double in the next few years.

Dementia is most common in old aged people [6-11]. People who avoid smoking tobacco, alcohol and promote physical activity and a healthy diet are said to have a very low risk of Dementia [12,13,14,15]. People with Dementia are also said to have some diseases like Diabetes Mellitus, various Cardiovascular diseases [16,17,18,19]. Depression may also be the main cause of Dementia; it is studied that 30-50% cases of Dementia are because of depression only [20,21,22]. Treatment of Dementia includes Pharmacology, Cognitive therapy [23,24]. BMI is another factor for causing Dementia [25]. People with optimal BMI are said to have a very low risk of Dementia. People with repeated negative thinking are most likely to

develop Dementia [26]. Environmental factors may also modify the risk of Dementia. People with widower status (most likely to have depression) had more risk of Dementia [27]. Sleep is also a reason for causing cognition. Habits of afternoon sleep are also said to develop Dementia [28]. Our team has extensive knowledge and research experience that has translated into high quality publications [29-33, 34-38].

The objective of this study is to inform the population about the unhealthy lifestyle which may cause Dementia and to change the lifestyle which includes a lot of physical exercise, healthy diet etc.

## 2. MATERIALS AND METHODS

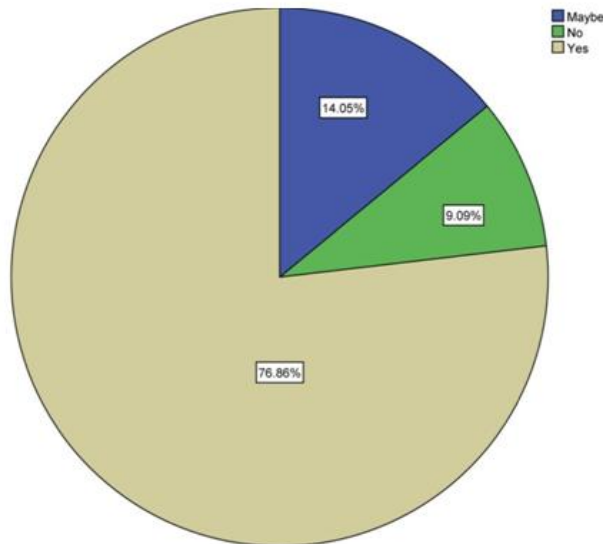
A cross-sectional study was done through quantitative methods among 121 adolescents of Saveetha Dental College, Chennai. The survey was conducted through Google Forms in February 2021. The survey consisted of 19 questions. The pro of the survey is that adolescents nowadays have many different lifestyles which lead to a variation in the population. The numbers of people involved in the study were two; one investigator and one chief investigator. Simple random sampling method was used to minimize the sampling bias. Statistical analysis was done with the help of chi-square test and the software used was SPSS v23.0. Chi-square test was done for the correlation of gender with awareness among the population. 'p-value' was calculated and value < 0.05 was considered as significant.

## 3. RESULTS

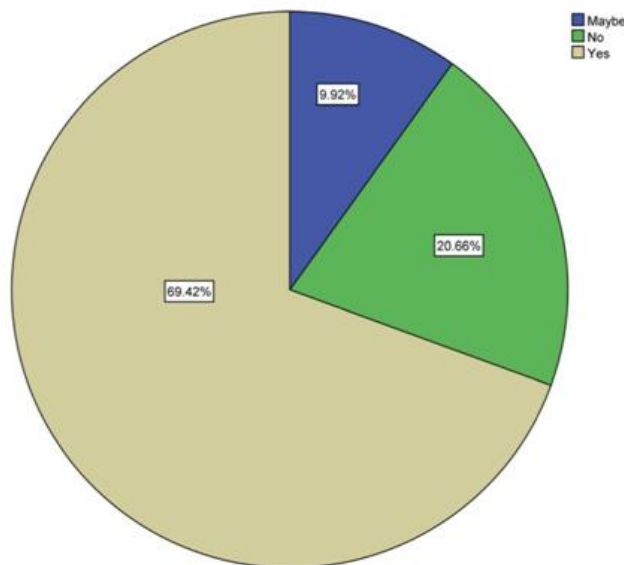
92.56% of people were aware that physical activity promotes a healthy brain whereas 4.13% disagreed with the statement. 76.86% of people

agreed that lifestyle affects memory whereas 14.5% were not aware [Fig. 1]. 69.2% agreed that depression can increase risk of Dementia [Fig. 2]. 92.56% agreed that regular physical exercise promotes a healthy brain. 80.17% agreed that age affects cognition whereas 19.83% were not aware. Additionally, 38.02% were neutral about the optimal BMI individuals having good memory power; 26.45% agreed with

the statement; 9.92% disagreed with the statement [Fig. 3]. 71.07% are aware that chronic dementia is not curable. 56.2% agree that change in lifestyle can lead to lower risk of Dementia [Fig. 4]. 81.82% are aware that negative thinking can harm the brain. 81.82% are aware of the diets which reduce the risk of Dementia while 61.6% only are aware of the harmful food which may cause Dementia.



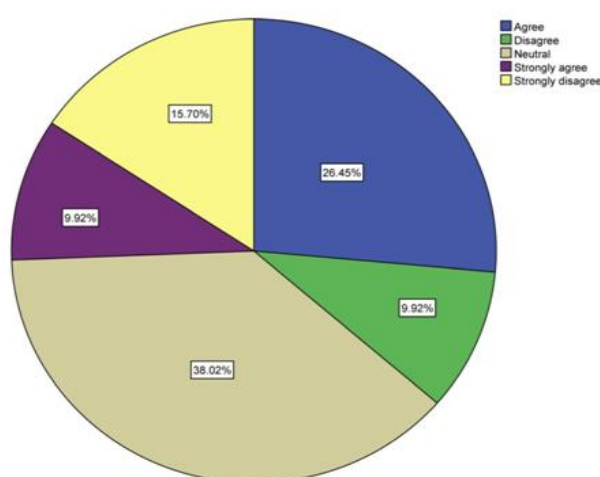
**Fig. 1. Pie chart showing percentage distribution of awareness on effect of lifestyle with memory. Majority of the participants 76.86% answered yes (cream), 9.09% answered no (green) and the remaining (14.05%) were not aware (blue)**



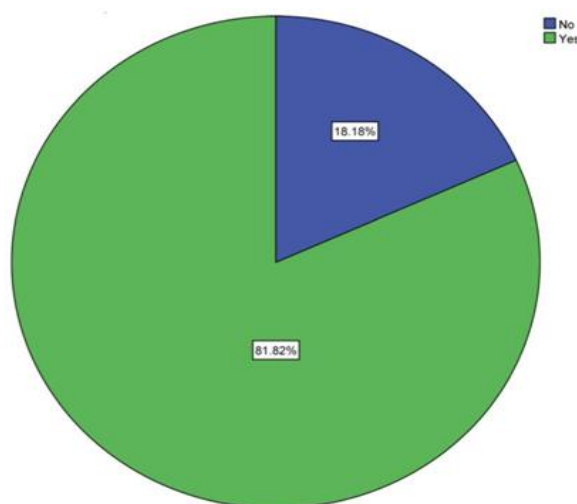
**Fig. 2. Pie chart on awareness of dementia with depression. 69.42% agreed that depression can increase the risk of dementia (cream), whereas 20.66% (green) disagreed with the statement and 9.92% were not aware (blue)**

48.76% agreed that diet plays an important role in causing Dementia whereas 32.23% disagreed. 78.51% agreed that smoking causes cognition while 85.59% agreed that alcohol can affect the memory. 50.41% agreed that diabetic people are at more risk of developing Dementia. 81.82% agree that negative thinking can harm the brain. 82.64% agree that stress; anxiety can cause Dementia while 62.81% agree that sleep affects Dementia. Out of 62 Females and 59 Males; 48 Females (77.4%) and 49 Males (76.2%) agreed that lifestyle affects the memory. p value was found to be 0.152 which means that there's no

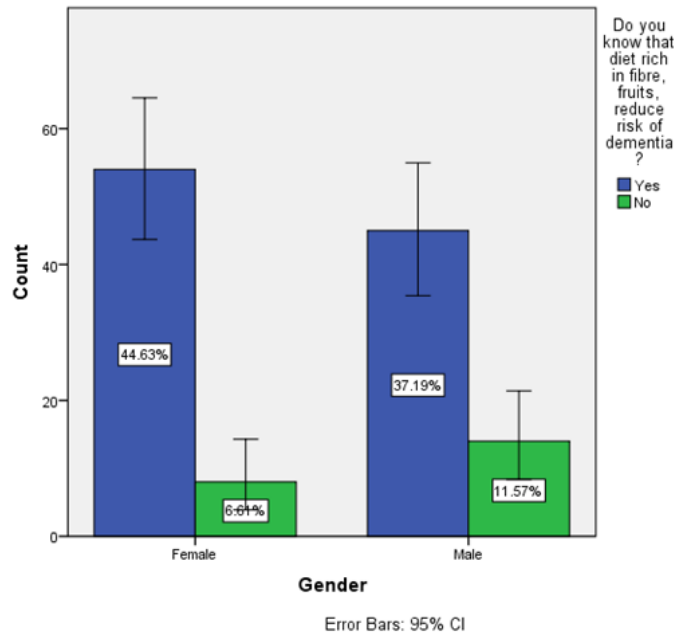
significant difference between males and females. 57 Females (91.9%) and 55 Males (93.2%) agreed that regular physical exercise promotes a healthy brain. The p value was found to be 0.559 which means that there's no significant difference between the genders. 36 Females (58%) and 23 Males (39%) were aware about the importance of diet and its role in causing Dementia. The p value was found to be 0.023 which means that there's a very high significant difference between males and females regarding the importance of diet [Fig. 5].



**Fig. 3. Pie chart showing percentage distribution on optimal BMI individuals having good memory power. 38.02% (cream) were neutral about the statement, 9.92% (purple) strongly agreed with the statement and 15.70% (yellow) strongly disagreed with the statement**



**Fig. 4. Pie chart showing awareness on diet which can reduce the risk of dementia. 81.82% (green) agreed that diets rich in fibre, fruits reduce the risk whereas 18.18% disagreed with the statement (blue)**



**Fig. 5.** The bar graph showing the association between gender and awareness about the diet which can reduce the risk of dementia. X-axis represents the gender and the Y-axis represents the percentage of responses. Females were more aware than males. Pearson chi square test showed the p value was 0.123 (>0.05), hence insignificant. 44.63% females and 37.19% males were aware and responded yes (Blue). 6.61% females and 11.57% males were not aware and responded no (Green)

#### 4. DISCUSSION

People diagnosed with disorders like Diabetes Mellitus, Hypertension, are most likely to get Dementia; this statement was agreed by 27.27% Females and 23.14% Males in this study. Similar study was done in 2014; there were similar findings in both the studies [39]. In this study 47.67% Females and 51.72% Males agreed that Smoking and alcohol affects memory, in the previous study, there were similar findings with p value 0.033 that means there's a significant difference between the gender and the statement [39].

Moreover, in this study, 47.11% Females and 36.36% Males agreed that depression causes Dementia and the p value was found to be 0.169. In the previous study [40], there were similar findings with p value 0.137 which means that there's no significant difference between the awareness of males and females related to smoking and alcohol which can increase the risk of dementia.

In another study, 96% of the respondents agreed that a good diet and exercise regularly helps in a good lifestyle, thereby reducing the risk of

dementia [41,42]. Established modifiable risk factors for dementia include: depression, diabetes, (midlife) hypertension, (midlife) obesity, smoking, alcohol abuse, high cholesterol, coronary heart disease, renal dysfunction, low unsaturated fat intake and inflammation [43]; in this study, 78.51% agree that regular smoking and 85.59% of the people agree that increased alcohol intake can increase the risk of dementia. Another study states that 69.4% of the people suffering from depression had inherited dementia [44], in this study 69.27% agree that depression can increase the risk of dementia.

In another study, 65 individuals with dementia volunteered and took the diagnosis of cognitively normal (CN) or Mild Cognitive Impairment (MCI) in every 2.5 years. The results stated that there was no association between stressful experiences and change to MCI [45,46]. The statement contradicts this study as 82.64% of the individuals agreed that stress; anxiety can increase risk of dementia.

The study was conducted in a very small sample size. Only adolescents were taken for the study from only one geographical area. This study could not provide strong evidence and effect

among the population. For future scope, this study is necessary as the medicines and therapies can only reduce the symptoms and Dementia; there's no cure for Dementia found till date.

## 5. CONCLUSION

Based on this study, females were more aware about the relation between Lifestyle and Dementia than males. More females were aware about the diet which is healthy for lower risk of dementia. Females agreed on the fact that smoking affects the memory. However, most of the people were neutral about the relation between BMI and Dementia.

## CONSENT

As per international standard or university standard, patients' written consent has been collected and preserved by the author(s).

## ETHICAL APPROVAL

We conducted our research after obtaining proper IEC approval.

## ACKNOWLEDGEMENT

The authors would like to thank all the participants for their valuable support and Saveetha Dental College for their support to conduct the study.

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

## REFERENCES

1. Polidori MC, Nelles G, Pientka L. Prevention of Dementia: Focus on Lifestyle. *International Journal of Alzheimer's Disease* 2010;2010:1–9. Available:https://doi.org/10.4061/2010/393579.
2. Saraswathi I, Saikarthik J, Senthil Kumar K, Madhan Srinivasan K, Ardhanaari M, Gunapriya R. Impact of COVID-19 outbreak on the mental health status of undergraduate medical students in a COVID-19 treating medical college: a prospective longitudinal study. *Peer J*. 2020;8:e10164.
3. Santhakumar P, Roy A, Mohanraj KG, Jayaraman S, Durairaj R. Ethanolic Extract of Capparis decidua Fruit Ameliorates Methotrexate-Induced Hepatotoxicity by Activating Nrf2/HO-1 and PPARγ Mediated Pathways. *Ind J Pharm Educ* 2021;55: s265–74.
4. Nambi G, Kamal W, Es S, Joshi S, Trivedi P. Spinal manipulation plus laser therapy versus laser therapy alone in the treatment of chronic non-specific low back pain: a randomized controlled study. *Eur J Phys Rehabil Med*. 2018;54:880–9.
5. Lourida I, Hannon E, Littlejohns TJ, Langa KM, Hyppönen E, Kuzma E, et al. Association of Lifestyle and Genetic Risk With Incidence of Dementia. *JAMA*. 2019; 322:430. Available:https://doi.org/10.1001/jama.2019.9879.
6. Rajakumari R, Volova T, Oluwafemi OS, Rajesh Kumar S, Thomas S, Kalarikkal N. Grape seed extract-soluplus dispersion and its antioxidant activity. *Drug Dev Ind Pharm* 2020;46:1219–29.
7. Clarizia G, Bernardo P. Diverse Applications of Organic-Inorganic Nanocomposites: Emerging Research and Opportunities: Emerging Research and Opportunities. IGI Global; 2019.
8. Prakash AKS, Devaraj E. Cytotoxic potentials of *S. cumini* methanolic seed kernel extract in human hepatoma HepG2 cells. *Environmental Toxicology*. 2019;34: 1313–9. Available:https://doi.org/10.1002/tox.22832
9. Tahmasebi S, Qasim MT, Krivenkova MV, Zekiy AO, Thangavelu L, Aravindhan S, et al. The effects of oxygen-ozone therapy on regulatory T-cell responses in multiple sclerosis patients. *Cell Biol Int* 2021;45: 1498–509.
10. Wadhwa R, Paudel KR, Chin LH, Hon CM, Madheswaran T, Gupta G, et al. Anti-inflammatory and anticancer activities of Naringenin-loaded liquid crystalline nanoparticles *in vitro*. *J Food Biochem* 2021;45:e13572.
11. Vivekanandhan K, Shanmugam P, Barabadi H, Arumugam V, Raj DDRD, Sivasubramanian M, et al. Emerging Therapeutic Approaches to Combat COVID-19: Present Status and Future Perspectives. *Frontiers in Molecular Biosciences*. 2021;8.

- Available:<https://doi.org/10.3389/fmolb.2021.604447>.
12. Anstey KJ, Mack HA, Cherbuin N. Alcohol Consumption as a Risk Factor for Dementia and Cognitive Decline: Meta-Analysis of Prospective Studies. *The American Journal of Geriatric Psychiatry* 2009;17:542–55. Available:<https://doi.org/10.1097/jgp.0b013e3181a2fd07>.
  13. Zhong G, Wang Y, Zhang Y, Guo JJ, Zhao Y. Smoking is associated with an increased risk of dementia: a meta-analysis of prospective cohort studies with investigation of potential effect modifiers. *PLoS One*. 2015;10:e0118333.
  14. Ezhilarasan D. Critical role of estrogen in the progression of chronic liver diseases. *Hepatobiliary Pancreat Dis Int*. 2020;19:429–34.
  15. Egbuna C, Mishra AP, Goyal MR. Preparation of Phytopharmaceuticals for the Management of Disorders: The Development of Nutraceuticals and Traditional Medicine. Academic Press; 2020.
  16. Khera AV, Emdin CA, Drake I, Natarajan P, Bick AG, Cook NR, et al. Genetic Risk, Adherence to a Healthy Lifestyle, and Coronary Disease. *N Engl J Med* 2016; 375:2349–58.
  17. Said MA, Verweij N, van der Harst P. Associations of Combined Genetic and Lifestyle Risks With Incident Cardiovascular Disease and Diabetes in the UK Biobank Study. *JAMA Cardiol* 2018;3:693–702.
  18. Kamath SM, Manjunath Kamath S, Jaison D, Rao SK, Sridhar K, Kasthuri N, et al. In vitro augmentation of chondrogenesis by Epigallocatechin gallate in primary Human chondrocytes - Sustained release model for cartilage regeneration. *Journal of Drug Delivery Science and Technology* 2020;60: 101992. Available:<https://doi.org/10.1016/j.jddst.2020.101992>
  19. Barabadi H, Mojab F, Vahidi H, Marashi B, Talank N, Hosseini O, et al. Green synthesis, characterization, antibacterial and biofilm inhibitory activity of silver nanoparticles compared to commercial silver nanoparticles. *Inorganic Chemistry Communications*. 2021;129:108647. Available:<https://doi.org/10.1016/j.inoche.2021.108647>.
  20. Bharath B, Perinbam K, Devanesan S, AlSalhi MS, Saravanan M. Evaluation of the anticancer potential of Hexadecanoic acid from brown algae *Turbinaria ornata* on HT–29 colon cancer cells. *Journal of Molecular Structure* 2021;1235:130229. Available:<https://doi.org/10.1016/j.molstruc.2021.130229>.
  21. Gowhari Shabgah A, Ezzatifar F, Aravindhan S, Olegovna Zekiy A, Ahmadi M, Gheibihayat SM, et al. Shedding more light on the role of Midkine in hepatocellular carcinoma: New perspectives on diagnosis and therapy. *IUBMB Life*. 2021;73:659–69.
  22. Zubenko GS, Zubenko WN, McPherson S, Spoor E, Marin DB, Farlow MR, et al. A collaborative study of the emergence and clinical features of the major depressive syndrome of Alzheimer’s disease. *Am J Psychiatry*. 2003;160:857–66.
  23. Wuthrich VM, Rapee RM, Draper B, Brodaty H, Low L-F, Naismith SL. Reducing risk factors for cognitive decline through psychological interventions: a pilot randomized controlled trial. *International Psychogeriatrics*. 2019;31:1015–25. Available:<https://doi.org/10.1017/s1041610218001485>.
  24. Areán PA, Raue P, Mackin RS, Kanellopoulos D, McCulloch C, Alexopoulos GS. Problem-solving therapy and supportive therapy in older adults with major depression and executive dysfunction. *Am J Psychiatry*. 2010;167: 1391–8.
  25. Gelber RP, Petrovitch H, Masaki KH, Abbott RD, Ross GW, Launer LJ, et al. Lifestyle and the risk of dementia in Japanese-american men. *J Am Geriatr Soc*. 2012;60:118–23.
  26. Marchant NL, Lovland LR, Jones R, Binette AP, Gonneaud J, Arenaza-Urquijo EM, et al. Repetitive negative thinking is associated with amyloid, tau, and cognitive decline. *Alzheimer’s & Dementia*. 2020;16: 1054–64. Available:<https://doi.org/10.1002/alz.12116>
  27. Fan L-Y, Sun Y, Lee H-J, Yang S-C, Chen T-F, Lin K-N, et al. Marital Status, Lifestyle and Dementia: A Nationwide Survey in Taiwan. *PLoS One*. 2015;10:e0139154.
  28. Xu W, Tan C-C, Zou J-J, Cao X-P, Tan L. Sleep problems and risk of all-cause cognitive decline or dementia: an updated

- systematic review and meta-analysis. *Journal of Neurology, Neurosurgery & Psychiatry*. 2020;91:236–44.  
Available:<https://doi.org/10.1136/jnnp-2019-321896>.
29. Sridharan G, Ramani P, Patankar S, Vijayaraghavan R. Evaluation of salivary metabolomics in oral leukoplakia and oral squamous cell carcinoma. *J Oral Pathol Med*. 2019;48:299–306.
  30. R H, Hannah R, Ramani P, Ramanathan A, Jancy MR, Gheena S, et al. 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*. 2020;130:306–12.  
Available:<https://doi.org/10.1016/j.oooo.2020.06.021>.
  31. J PC, Pradeep CJ, Marimuthu T, Krithika C, Devadoss P, Kumar SM. Prevalence and measurement of anterior loop of the mandibular canal using CBCT: A cross sectional study. *Clinical Implant Dentistry and Related Research*. 2018;20:531–4.  
Available:<https://doi.org/10.1111/cid.12609>
  32. Wahab PUA, Abdul Wahab PU, Madhulaxmi M, Senthilnathan P, Muthusekhar MR, Vohra Y, et al. Scalpel Versus Diathermy in Wound Healing After Mucosal Incisions: A Split-Mouth Study. *Journal of Oral and Maxillofacial Surgery*. 2018;76:1160–4.  
Available:<https://doi.org/10.1016/j.joms.2017.12.020>.
  33. Mudigonda SK, Murugan S, Velavan K, Thulasiraman S, Krishna Kumar Raja VB. Non-suturing microvascular anastomosis in maxillofacial reconstruction- a comparative study. *Journal of Cranio-Maxillofacial Surgery*. 2020;48:599–606.
  34. Needhidasan S, Samuel M, Chidambaram R. Electronic waste - an emerging threat to the environment of urban India. *J Environ Health Sci Eng*. 2014;12:36.
  35. Saravanan M, Arokiyaraj S, Lakshmi T, Pugazhendhi A. Synthesis of silver nanoparticles from *Phenerochaete chrysosporium* (MTCC-787) and their antibacterial activity against human pathogenic bacteria. *Microb Pathog* 2018; 117:68–72.
  36. Gupta P, Ariga P, Deogade SC. Effect of monopoly-coating agent on the surface roughness of a tissue conditioner subjected to cleansing and disinfection: a contact profilometric *in vitro* study. *Contemp Clin Dent*. 2018;9: S122–6.
  37. Devi VS, Gnanavel BK. Properties of Concrete Manufactured Using Steel Slag. *Procedia Engineering*. 2014;97:95–104.
  38. Krishnaswamy H, Muthukrishnan S, Thanikodi S, Arockiaraj G, Venkatraman V. Investigation of air conditioning temperature variation by modifying the structure of passenger car using computational fluid dynamics. *Thermal Science*. 2020;24:495–8.  
Available:<https://doi.org/10.2298/tsci190409397k>.
  39. Zhou S, Zhou R, Zhong T, Li R, Tan J, Zhou H. Association of smoking and alcohol drinking with dementia risk among elderly men in China. *Curr Alzheimer Res*. 2014;11:899–907.
  40. Giurgiu RL, Călin MF. The association between depression and dementia and gender differences among older adults. *Proceedings of DIALOGO-CONF 2017 2017*.  
Available:<https://doi.org/10.18638/dialogo.2017.4.1.5>.
  41. Kivipelto M, Mangialasche F, Ngandu T. Lifestyle interventions to prevent cognitive impairment, dementia and Alzheimer disease. *Nat Rev Neurol*. 2018;14:653–66.
  42. R GD, Gayatri DR, Sethu G. Evaluation of adenoids by oronasal and nasal spirometry. *Asian Journal of Pharmaceutical and Clinical Research* 2018;11:272.  
Available:<https://doi.org/10.22159/ajpcr.2018.v11i10.27365>.
  43. Cunningham EL, McGuinness B, Herron B, Passmore AP. Dementia. *Ulster Med J*. 2015;84:79–87.
  44. Livingston G, Huntley J, Sommerlad A, Ames D, Ballard C, Banerjee S, et al. Dementia prevention, intervention, and care: 2020 report of the Lancet Commission. *The Lancet* 2020;396:413–46.  
Available:[https://doi.org/10.1016/s0140-6736\(20\)30367-6](https://doi.org/10.1016/s0140-6736(20)30367-6).
  45. Peavy GM, Jacobson MW, Salmon DP, Gamst AC, Patterson TL, Goldman S, et



- al. The Influence of Chronic Stress on Dementia-related Diagnostic Change in Older Adults. *Alzheimer Disease & Associated Disorders*. 2012;26:260–6. Available:<https://doi.org/10.1097/wad.0b013e3182389a9c>.
46. R G, Gayatri R, Sethu G. Establishing norms for nasal spirometry. *National Journal of Physiology, Pharmacy and Pharmacology*. 2018;8:1188. Available:<https://doi.org/10.5455/njppp.2018.8.0414226042018>.

---

© 2021 Arora et al.; This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

*Peer-review history:*  
*The peer review history for this paper can be accessed here:*  
<https://www.sdiarticle4.com/review-history/74339>