



UWI
ST. AUGUSTINE
CAMPUS

FACULTY OF
MEDICAL SCIENCES

The Aetiology of Non-Carious Cervical Lesions - A Mini Review

Shania Atherton, Vanita Benny, Stephanie Fosi-Mbantenkhu, Victoria Medford, Vandana Ramcharan, Sheniel Thomas, Dr. Sunethra Rajapakse

¹School of dentistry, Faculty of Medical Sciences, The University of the West Indies

e: stephanie.fosimbantenkhu@my.uwi.edu Sunethra.Rajapakse@sta.uwi.edu



Introduction

Non carious cervical lesions are characterized by the loss of tooth structure at the cemento-enamel junction caused by wear processes and not by bacterial activity. They have clearly defined edges that are deeper rather than wider, and their internal angle can be either more rounded or sharp. They appear in a variety of shapes and sizes, and are categorized as wedge-shaped, grooved, concave, irregular and shallow NCCLs. Studies show that their aetiology is multifactorial, amongst which are: erosive agents, acidic diets, oral hygiene habits (technique, frequency, force, duration), occlusal stress forces and some medical conditions (GERD).

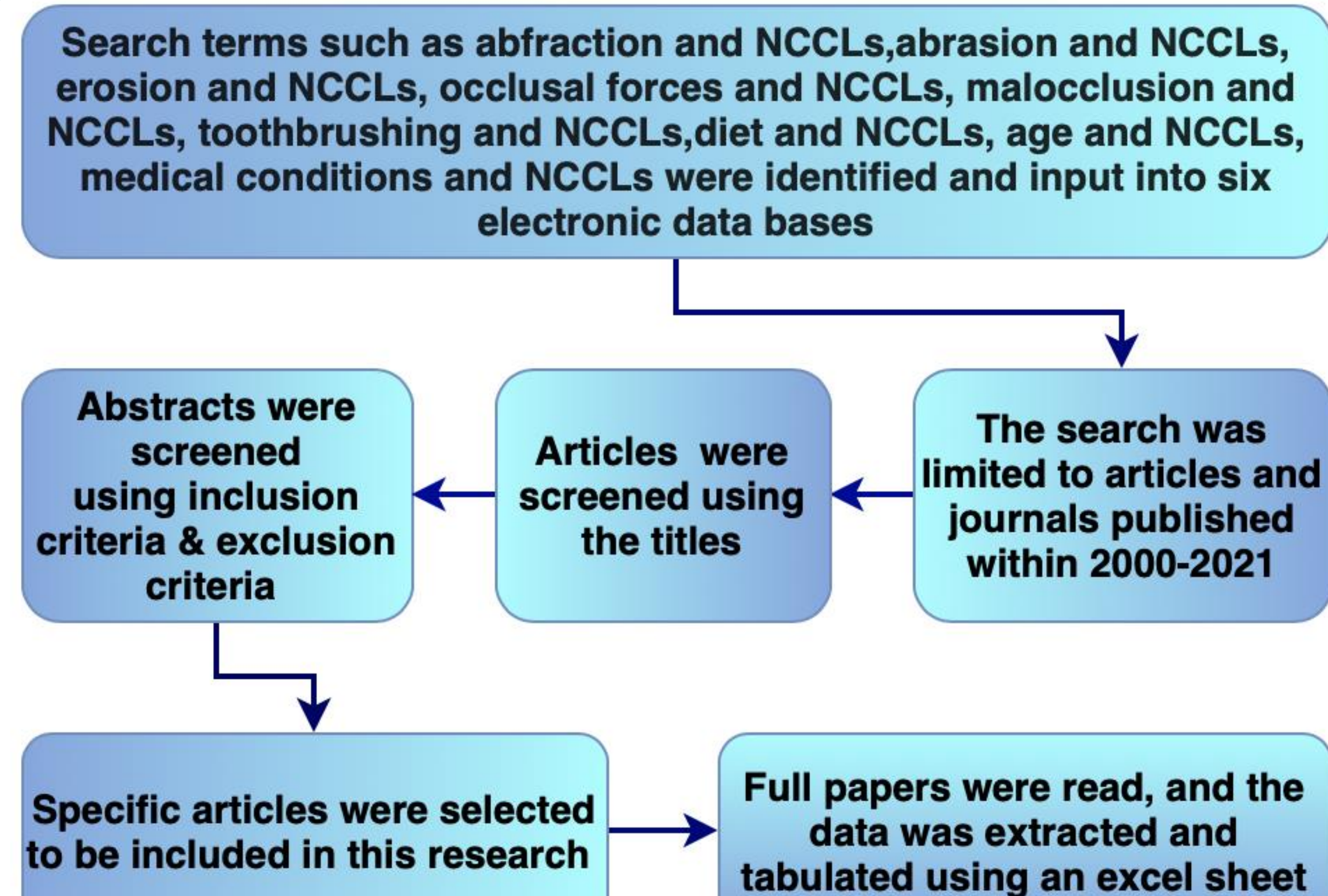


Photo courtesy Dr. William Smith

Objective

- To review the aetiological factors associated with NCCLs.
- To identify the risk factors of NCCLs.

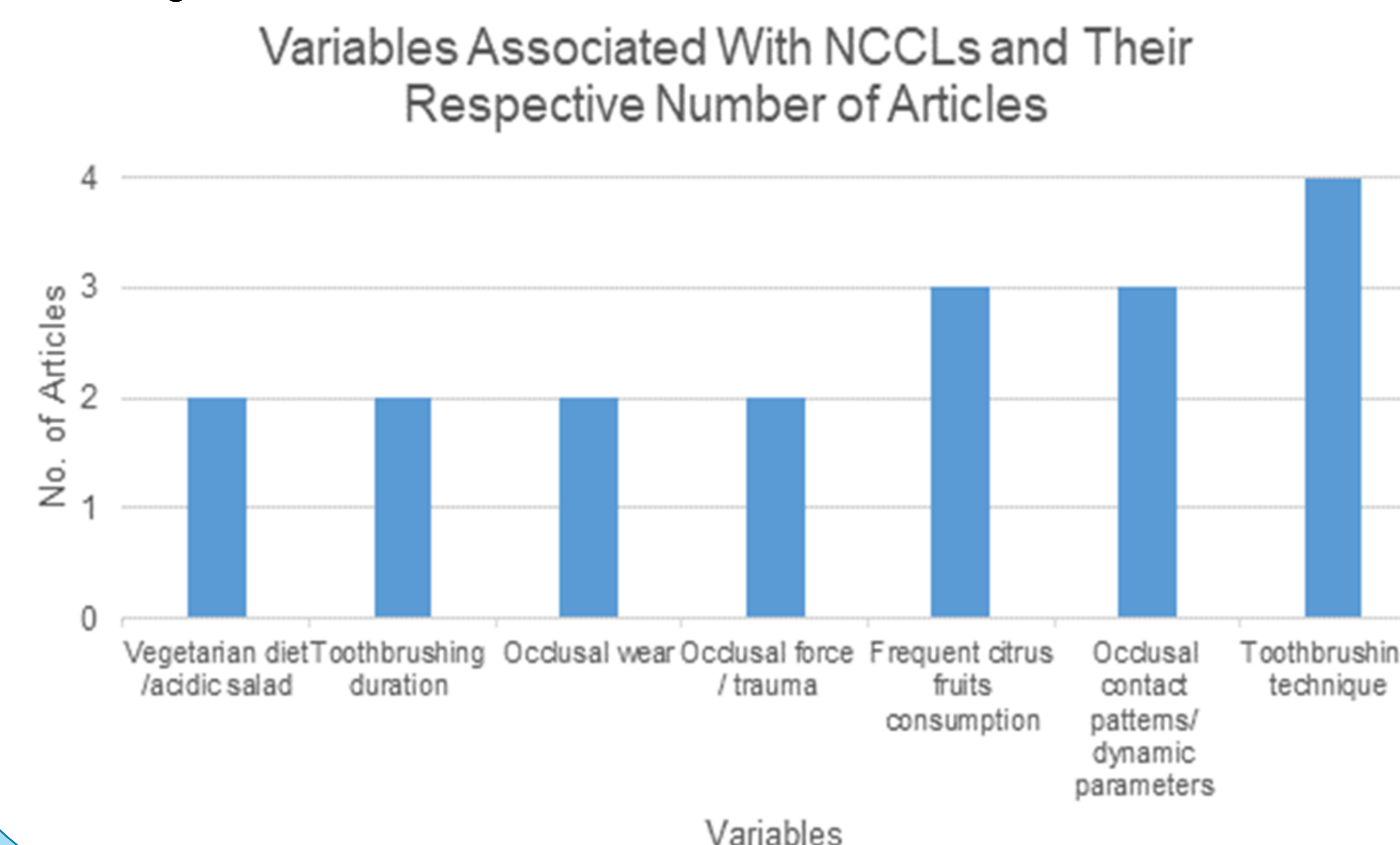
Methodology



Results

160 articles were generated and screened based on their titles which resulted in 46 articles. 12 articles (ten cross-sectional and two case control studies) were selected after further consideration using inclusion and exclusion criteria. The results of which are as follows:

- Vegetarian diet/acidic salad (1 cross-sectional and 1 case control study)
- Toothbrushing duration (3 cross-sectional, 1 case control)
- Occlusal wear (2 cross-sectional)
- Occlusal force/trauma (1 cross-sectional and 1 case control)
- Frequent citrus fruits consumption (3 cross-sectional studies)
- Occlusal contact patterns/dynamic parameters (3 cross-sectional)
- Toothbrushing technique (3 cross-sectional, 1 case control)
- Age was found to be a risk factor of NCCLs.

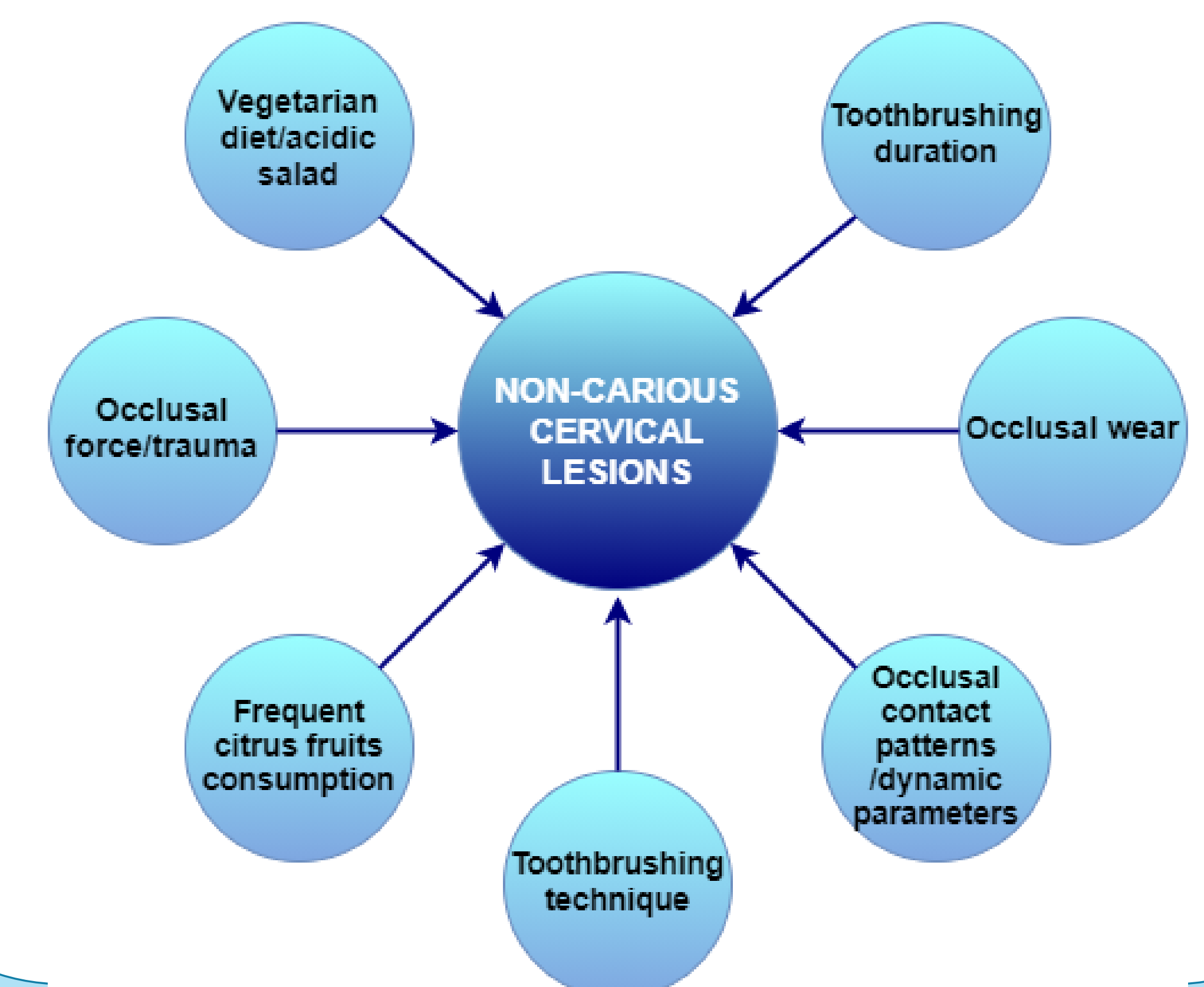


Discussion

- Horizontal toothbrushing technique was more associated with NCCLs as compared to vertical toothbrushing (Que et al. 2013 (P<0.05) and Haralur et al. 2019 (p<0.01)). And toothbrushing duration showed a positive association with NCCLs (Que et al. 2013 (P<0.05) and Haralur et al. 2019 (P<0.01)).
- There was a statistically significant association between frequent citrus fruit consumption and NCCLs (p=0.002 by Medeiros et al. 2020), (p=0.003 by Smith et al. 2008) and by Kolak et al. 2018 (p<0.01) as well as vegetarian diet (Smith et al. 2008 and Alvarez-Arenal et al. 2019 (P=0.0155)).
- Occlusal Parameters (contact patterns/dynamic parameters, occlusal force/trauma and occlusal wear) were suggested as contributory factors of NCCLs by (Hirata et al. 2010 (p<0.05), (Alvarez-Arenal et al. 2019, Haralur et al. 2019) and Smith et al. 2008 and Yang et al. 2016 (P<0.01) respectively.
- Although this study showed the above variables to be associated with NCCLs, the study types included in this research were cross-sectional and case control studies which provided evidence at a lower hierarchical level. Therefore, caution needs to be taken when interpreting these results.

Conclusion

- This research supports the multifactorial aetiology of NCCLs. However, the type of study reviewed, warrants further prospective longitudinal studies on this topic.



References

- Que K, Guo B, Jia Z, Chen Z, Yang J, Gao P. A cross-sectional study: non-carious cervical lesions, cervical dentine hypersensitivity and related risk factors. *J Oral Rehabil.* 2013;40(1):24-32.
- Haralur SB, Alqahtani AS, AlMazni MS, Alqahtani MK. Association of non-carious cervical lesions with oral hygiene habits and dynamic occlusal parameters. *Diagnostics (Basel).* 2019;9(2):43.
- Hirata Y, Yamamoto T, Kawagoe T, Sasaguri K, Sato S. Relationship between occlusal contact pattern and non-carious cervical lesions among male adults. *International journal of stomatology & occlusion medicine.* 2016;3:10-14.
- Medeiros TLM, Mutran SCAN, Espinosa DG, do Carmo Freitas Faial K, Pinheiro HHC, D'Almeida Couto RS. Prevalence and risk indicators of non-carious cervical lesions in male footballers. *BMC Oral Health.* 2020;20(1):215.
- Smith WAJ, Marchan S, Rafeek RN. The prevalence and severity of non-carious cervical lesions in a group of patients attending a university hospital in Trinidad. *J Oral Rehabil.* 2008;35(2):128-34.
- Kolak V, Pešić D, Melih I, Lalović M, Nikitović A, Jakovljević A. Epidemiological investigation of non-carious cervical lesions and possible etiological factors. *J Clin Exp Dent.* 2018;10(7):648-56.
- Alvarez-Arenal A, Alvarez-Menendez L, Gonzalez-Gonzalez I, Alvarez-Riesgo JA, Brizuela-Velasco A, deLlanos-Lanchares H. Non-carious cervical lesions and risk factors: A case-control study. *J Oral Rehabil.* 2019;46(1):65-75.
- Yang J, Cai D, Wang H, Ma L, Jin Y, Que K. Non-carious cervical lesions (NCCLs) in a random sampling community population and the association of NCCLs with occlusal wear. *Journal of Oral Rehabilitation.* 2016;43(2):960-966.
- Nguyen C, Ranjitkar S, Kaidonis JA, Townsend GC. A qualitative assessment of non-carious cervical lesions in extracted human teeth. *Australian dental journal.* 2008;53(1):46-51.
- Grippio J, Simring M, Schreiner S. Attrition, abrasion, corrosion and abfraction revisited. A new perspective on tooth surface lesions. *Journal of American Dental Association.* 2004;135:1109-1117.
- Michael JA, Kaidonis JA, Townsend GC. Non-carious cervical lesions on permanent anterior teeth: a new morphological classification: Morphology of non-carious cervical lesions. *Aust Dent J.* 2010;55(2):134-7.
- Rusu Olaru A, Popescu MR, Dragomir LP, Popescu DM, Arsenie CC, Rauten AM. Identifying the etiological factors involved in the occurrence of non-carious lesions. *Curr Health Sci J.* 2019;45(2):227-34.

Acknowledgments

We would like to thank Dr. William Smith for providing us with pictures and Kevin Mohammed for sorting articles for this research.