

Knowledge, Awareness, And Perceptions Regarding Nursing Bottle Caries Among Dental Students - A Survey

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How to cite this article: Raja Kumar, Jasmine Jaideep Rayapudi (2024) Knowledge, Awareness, And Perceptions Regarding Nursing Bottle Caries Among Dental Students - A Survey. *Library Progress International*, 44(3), 16305-16321

ABSTRACT

INTRODUCTION: The most prevalent chronic disease affecting children is dental caries, which is brought on by the interaction of bacteria, primarily *Streptococcus mutans*, and sugary foods on enamel. The etiology of the conditions was linked, with improper nursing practices as the main target. The terms "infant cavity," "infant caries," "baby bottle-fed cavity," "infant dental decay," "comforter caries," "nursing caries," "maxillary anterior caries," "rampant caries," and many others are interchangeable.

MATERIALS AND METHOD: Google excel sheets were used to record the results of the survey on dental students' knowledge, awareness, and practices regarding nursing bottle caries. The statistical level of significance was set at 0.005. SPSS version 21.0 (IBM Inc., Armonk, NY, USA) was used to analyze all of the data. To represent output variables, pie charts and bar diagrams were employed. 100 second-year dental students participated in this study.

RESULT: Graph illustrating the methods used to treat dental caries in nursing bottles, with extraction accounting for 4%, fluoride application for 35%, and pulpotomy or pulpectomy for 14% of cases. It demonstrates understanding of the organisms that are most commonly responsible for nursing bottle caries, including 80 percent of *Streptococcus mutans*, 16 percent *Corynebacterium diphtheria*, 1 percent *Staphylococcus aureus*, and 1 percent *Streptococcus pyogenes*.

CONCLUSION: Within the constraints of the study, we can draw the conclusion that dental students have good understanding, awareness, and practice regarding nursing bottle caries. To raise awareness among high school, college, and university students about risk factors and complications of treatment protocols, prevention techniques may include awareness camps, social media, workshops, and seminars.

KEYWORDS: Eco Friendly, Fluoride, Innovative Technique, Milk Feeding, Fluoride, Nursing Bottle Caries

1. INTRODUCTION

In the realm of dental health, dental caries stands out as the most prevalent chronic ailment, stemming from the intricate interaction between bacteria, primarily *Streptococcus mutans*, and the consumption of sugary foods, which has a direct impact on enamel. Transmission of *Streptococcus mutans*, in large part, occurs from mother to child during infancy. These bacteria, in their metabolic processes, metabolize sugars to generate energy, creating an acidic milieu within the oral cavity. This acidic environment contributes to the demineralization of enamel, ultimately culminating in the formation of cavities.¹ The phenomenon of Early Childhood Caries (ECC) is a matter of significant concern within the public health domain, both in developing and developed nations.²

ECC can manifest at a very early age and tends to progress rapidly, particularly among individuals with heightened susceptibility.^{3,4} Alarmingly, ECC often goes untreated, underscoring the gravity of the issue. In toddlers and infants, dental caries assumes a distinctive pattern. Various terms, such as nursing bottle caries, infant caries, baby bottle-fed cavity, infancy dental decay, and comforter caries, are employed to describe this dental condition.^{5,6} ECC is precisely defined as "the presence of one or more decayed, missing, or filled tooth surfaces in any primary tooth of a child aged 72 months or younger." In the case of children under 3 years old, any indication of caries on a smooth tooth surface signifies a severe form of infancy caries.

Inappropriate utilization of baby bottles significantly contributes to the development and severity of ECC. Within the dental

community, there exists a consensus that extended and nocturnal breastfeeding is associated with an elevated risk of ECC, particularly when it continues beyond the age of 12 months. These associations can be attributed to the diminished production of saliva during nighttime hours, resulting in higher concentrations of lactose in resting saliva and prolonged bacterial plaque accumulation compared to daytime conditions. Consequently, the balance between demineralization and remineralization tilts toward demineralization during the night due to the reduced protective effects of nocturnal salivary flow.⁷ Child health professionals, including pedodontists, physicians, physician assistants, and nurses, hold a significant role in mitigating the prevalence of this disease.

Prior research endeavors have primarily centered on diverse approaches aimed at preventing dental caries in children during their formative years. These studies have primarily sought to address and ameliorate the issue of nursing bottle caries.^{8,9} In parallel, there has been a separate body of research that has concentrated on the primary microorganism responsible for nursing bottle caries.

Addressing ECC often entails a range of interventions, with the choice dependent on the child's age, social factors, behavioral traits, and medical history. It is considered a prudent and proactive measure to conduct a thorough dental examination of a child by their first birthday as an integral component of ECC prevention and intervention strategies.¹⁰

The primary objective of this study was to educate dental students about nursing bottle caries, equipping them with comprehensive knowledge and heightened awareness regarding the condition's signs, symptoms, and available treatment protocols. The study sought to gauge the extent of knowledge, awareness, and perceptions concerning nursing bottle caries among students in dental colleges.

MATERIAL AND METHODS:

A prospective observational study was carried out subsequent to the approval of ethical considerations by the Scientific Review Board at Saveetha Dental College in Chennai. The method of simple random sampling was employed to choose 100 students from the college for the purpose of this investigation.

Study Design and Data Collection:

Data collection was enabled through the application of self-structured questionnaires. The questionnaires' content validity was ensured through a comprehensive examination of pertinent research articles. It comprehensively encompassed aspects pertaining to the symptoms, etiology, indicators, prevention, and treatment of dental caries caused by nursing bottle usage. The questionnaires were divided into two distinct sections. The initial section obtained sociodemographic data, while the subsequent section was formulated to assess the participants' knowledge and attitudes. To further the process of data collection, the questionnaires were circulated to dental students through a Google Form link. Respondents were allotted a duration of one week to fulfill the survey.

The variables observed in the study encompassed demographic information, alongside the comprehension, consciousness, and behaviors pertaining to nursing bottle caries among dental students. The data obtained were registered in Google Excel spreadsheets. A statistical level of significance of 0.005 was set. The investigation of the data was directed using SPSS version 21.0, developed by IBM Inc., situated in Armonk, NY, USA. The depiction of the variables of interest was visually illustrated through the utilization of pie charts and bar diagrams.

RESULT

TABLE 1: - Distribution of responses of social and demographic details of the participants

SOCIO-DEMOGRAPHIC DATA		
QUESTIONS	RESPONSES	PERCENTAGE
1. Gender		
Male	81	81.00 %
Female	19	19.00 %

2. Age		
17 - 19 years	6	6.00 %
20 - 22 years	17	17.00 %
23 - 25 years	61	61.00 %
25 years above	16	16.00 %
3. Graduation		
Undergraduate	76	76.00 %
Postgraduate	24	24.00 %
4. Year		
1 st year	5	5.00 %
2 nd year	25	25.00 %
3 rd year	31	31.00 %
4 th year	27	27.00 %
Internship	12	12.00 %

TABLE 2: - Distribution of responses to knowledge and attitude questions among the study participants

KNOWLEDGE AND ATTITUDE		
QUESTIONS	RESPONSES	PERCENTAGE
1. Do you think that nursing bottle caries will affect the developing permanent tooth bud Yes No	 81 19	 81.00 % 19.00 %
2. Do you have any knowledge about nursing bottle neck caries Yes No	 86 14	 86.00 % 14.00 %
3. Are you aware that nursing bottle neck caries are also known as 'Early Childhood caries ' Yes No	 31 69	 31.00 % 69.00 %

4. Are you aware of causative microorganisms that cause nursing bottle neck caries		
Streptococcus mutans	80	80.00 %
corynebacterium diphtheriae	16	16.00 %
Staphylococcus aureus	1	1 %
Streptococcus pyogenes	1	1 %
5. Which age group is mainly affected by nursing bottle caries		
At birth		
2 - 5 months	20	20.00 %
5 - 10 months	3	3 %
2 - 3 years	41	41 %
	36	36 %
6. Do you know any treatment for nursing bottle caries		
Yes		
No	86	86.00 %
	14	14.00 %
7. PPM of fluoride recommended for infants or children		
less than 1000 PPM	40	40.00%
1000 -1400 PPM	60	60.00%
8. What is the treatment of nursing bottle caries involving the pulp		
Fluoride application		
caries excavation and restoration	35	35.00 %
pulpotomy or pulpectomy	47	47.00 %
extraction	4	4.00 %
	14	14.00 %
9. How do you prevent nursing bottle caries		
brushing and cleaning the gum pad at night	31	31.00 %
Fluoride	8	8.00 %
prevent feeding at night	43	43.00 %
All the above	18	18.00 %
10. Which teeth are protected in early childhood caries		

upper anterior	71	7.00 %
lower anterior	23	23.00 %
upper molar	5	5.00 %
lower molar	1	1.00 %
11. Do you know the procedure for caries assessment		
Yes	86	86.00 %
No	14	14.00 %

KAP ASSESSMENT:**SOCIAL DEMOGRAPHIC DATA: -**

[**Figures 1**] Graph depicted the gender of the participants, 81.00 % were male and 19.00 % were female. [**Figure 2**] It shows that age group of participants, 6.00 % belong to the age group 17-19 years, 17.00 % belong to the age group 20 -22 years, 81.00 % belong to the age group 23-25 years, 16.00 % belong to age group 25 years above. [**Figure 3**] Graph showing the distribution of graduations of participants, 76.00 % belong to undergraduate and 24.00 % belong to postgraduate. [**Figure 4**] Graph showing the year of participants, 5.00 % were 1 st year, 25.00 % were 2 nd year, 31.00 % were 3 rd year, 27.00 % were 4 th year and 12.00 % were Internship.

KNOWLEDGE AND ATTITUDE: -

[**Figure 1**] It shows that nursing bottle caries affect the developing tooth, 81 % said Yes and 19 % said No. [**Figure 2**] It shows that the responses about knowledge of nursing bottle caries, 86.00 % agreed Yes and 14.00 % agreed No.

[**Figure 3**] It shows the awareness of early childhood caries, 31.00 % were Yes and 69.00 % still not aware. [**Figure 4**] It shows responses about knowledge of organism mainly affected on nursing bottle caries, 80.00 % were streptococcus mutans, 16.00 % were Corynebacterium diphtheria, 1.00 % were staphylococcus aureus, and 1.00 % - streptococcus pyrogens.

[**Figure 5**] The graph showing the age group most affected by nursing bottle caries, 41.00 % agreed 2-5 years and 36.00 % agreed 5- 10 months. [**Figure 6**] Graph showing the treatment plan for nursing bottle caries, 86.00 % said Yes and 14.00 % still not aware.

[**Figure 7**] It shows responses about PPM fluoride recommended for infants or children, 40.00 % agreed 1000 - 1400, 60.00 % said less than 1000 PPM . [**Figure 8**] Treatment nursing bottle caries, 47.00 % said caries excavation and restoration, 4.00 % said extraction, 35.00 % said fluoride application and 14.00 % - pulpectomy or pulpectomy.

[**Figure 9**] It shows the responses about preventing nursing bottle caries, 31.00 % said brushing and cleaning the gum pad at night, 8.00 % they use fluoride, 43.00 % said prevents feeding at night and 18.00 % said all the above. [**Figure 10**] The graph showing protection in early childhood caries, 23.00 % agreed lower anterior and 71.00 % agreed on upper anterior. [**Figure 11**] 86 % said that know the procedure of caries assessment and 14 % still don't know.

The association graph between graduation and microorganism [**Figure 12**], prevention [**Figure 13**], affected tooth [**Figure 14**].

DISCUSSION:

Nursing bottle caries, a dental condition, can occur when children are given sweetened beverages such as milk, formula, or fruit juices, as well as pacifiers dipped in sugar, typically during nap times or at night. These substances remain on the teeth for prolonged periods, creating an environment conducive for bacterial metabolism of the sugars, resulting in acid production. Consequently, these acids initiate an attack on the enamel, leading to the formation of cavities.¹¹

Nursing bottle caries may present in various ways, with visible cavities being a common manifestation, particularly

affecting the front upper teeth. It may also result in infections, tooth pain, and premature loss of teeth, all of which are potential consequences of this condition.¹²

Conducting a caries risk assessment during a child's initial visit to the dentist serves as a valuable tool for establishing baseline data. This data is essential for offering guidance to parents on the prevention of dental decay.¹³ Children assessed as being at low risk generally do not require any restorative procedures.¹⁴ However, for children classified as high risk, early restorative interventions may be necessary. These interventions may include addressing enamel proximal lesions and treating progressing and cavitated lesions to mitigate the ongoing development of caries.¹⁵

The findings of this study reveal that 86% of the dental students, encompassing both undergraduates and postgraduates, possess a greater understanding of nursing bottle caries when compared to a study conducted by Wei-Jen Chang and colleagues in 2014. Chang's study indicated a low level of knowledge among pediatricians regarding caries prevention and the treatment of nursing bottle caries.¹⁶ This suggests that dental students are better equipped to recognize and address nursing bottle caries, underlining their proficiency in this area.

In our study, we discovered that 80% of dental students, particularly undergraduates, identified *Streptococcus mutans* as the primary organism responsible for causing nursing bottle caries. This contrasts with previous research conducted by various authors, which indicated that both *Streptococcus mutans* and *Streptococcus sobrinus* were the two principal cariogenic organisms associated with nursing bottle caries.¹⁷⁻²⁰ From our findings, we can conclude that *Streptococcus mutans* is the predominant organism contributing to dental issues in cases of nursing bottle caries.

In a study by Bo Hyung in 2003, it was reported that 56.5% of affected children typically fell within the 6 to 9-month age range. In comparison to our findings, 36% of participants cited infants between 5 and 10 months of age as the most commonly affected group by nursing bottle caries.²¹ Another similar study also indicated that the age group most frequently affected was between 6 and 18 months.²² Therefore, based on these findings, we can infer that nursing bottle caries most commonly affects children between the ages of 5 and 18 months.

In our study, 33% of the participants believed that nursing bottle caries could be prevented by discontinuing night-time feeding, which, in turn, could reduce the incidence of nursing bottle caries. Our findings align with previous research, which has consistently identified bottle feeding and sleeping with a bottle at night as significant contributors to dental caries in preschool children.²³ This issue can be addressed by discouraging nighttime breastfeeding or bottle feeding and, if the child is thirsty, substituting it with water.

Furthermore, 35% of dental students in our study opted for the application of fluoride as the most effective strategy for treating and preventing nursing bottle caries. A similar approach was also observed in Taiwan, where 34% of dentists utilized fluoride varnish biannually to prevent nursing bottle caries in children aged 0 to 4. This practice yielded positive results, demonstrating the effectiveness of fluoride in both treating dental caries and preventing further damage.

Nevertheless, it is important to acknowledge several limitations within this study. Firstly, the study was constrained by a relatively small sample size, which may have impacted its ability to identify potential confounding factors accurately. Secondly, the self-reporting of postgraduate practice behaviors, particularly in terms of willingness to engage in specific activities, may not entirely reflect actual practice patterns. Thirdly, it is essential to recognize that overall Knowledge, Attitudes, and Practices (KAP) surveys inherently come with limitations. For instance, respondents may be influenced to provide certain responses, and the multiple-choice format of the questionnaire might inadvertently steer them toward socially desirable answers. These limitations should be taken into consideration when interpreting the study's findings.

5. CONCLUSION:

It is reasonable to conclude that dental students demonstrate a commendable level of knowledge, awareness, and practical understanding regarding nursing bottle caries, despite the acknowledged limitations of this study. This result implies that there is a solid basis in place to encourage student dental health education. Initiatives like awareness camps, social media campaigns, workshops, and seminars may be held to further increase awareness and understanding. The information that is spread about the risk factors, potential complications, treatment protocols, and preventive measures related to nursing bottle caries can be the focus of these activities. By focusing these educational initiatives on school, college, and university students, we can promote improved oral hygiene habits and reduce the occurrence of nursing bottle caries.

6. ACKNOWLEDGMENT:

We thank Saveetha dental college for supporting us to conduct the study.

7. CONFLICT OF INTEREST:

NIL

8. SOURCE OF FUNDING

The present study was support by the following people agencies

- Saveetha Dental college
- SIMATS, Saveetha University
- Makani Textile

9. REFERENCES:

1. Silk H, Douglass AB, Maier R, Clark M, Deutchman M, Douglass J, et al. Smiles for Life National Oral Health Curriculum: Module 5. Oral Health in Pregnancy [Internet]. Vol. 8, MedEdPORTAL. 2012. Available from: http://dx.doi.org/10.15766/mep_2374-8265.9259
2. Livny A, Assali R, Sgan-Cohen HD. Early Childhood Caries among a Bedouin community residing in the eastern outskirts of Jerusalem. BMC Public Health. 2007 Jul 24;7:167.
3. Grindefjord M, Dahllöf G, Modéer T. Caries Development in Children from 2.5 to 3.5 Years of Age: A Longitudinal Study [Internet]. Vol. 29, Caries Research. 1995. p. 449–54. Available from: <http://dx.doi.org/10.1159/000262113>
4. Tickle M. A randomised controlled trial to evaluate the cost effectiveness of prescribing high concentration fluoride toothpaste to prevent tooth decay in older adults [Internet]. <http://isrctn.com/>. Available from: <http://dx.doi.org/10.1186/isrctn11992428>
5. Verger-Pratoucy, Verger-Pratoucy. La carie dentaire existait-elle chez l'homme du Paléolithique ? [Internet]. Vol. 64, Bulletin de la Société préhistorique française. Comptes rendus des séances mensuelles. 1967. p. 91–5. Available from: <http://dx.doi.org/10.3406/bspf.1967.8950>
6. Ismail AI, Sohn W. A Systematic Review of Clinical Diagnostic Criteria of Early Childhood Caries [Internet]. Vol. 59, Journal of Public Health Dentistry. 1999. p. 171–91. Available from: <http://dx.doi.org/10.1111/j.1752-7325.1999.tb03267.x>
7. Helderma WH van P, van Palenstein Helderma WH, Soe W, van 't Hof MA. Risk Factors of Early Childhood Caries in a Southeast Asian Population [Internet]. Vol. 85, Journal of Dental Research. 2006. p. 85–8. Available from: <http://dx.doi.org/10.1177/154405910608500115>
8. Dülgergil ÇT, Türksel Dülgergil Ç, Satıcı Ö, Yildirim I, Yavuz İ. Prevention of caries in children by preventive and operative dental care for mothers in rural Anatolia, Turkey [Internet]. Vol. 62, Acta Odontologica Scandinavica. 2004. p. 251–7. Available from: <http://dx.doi.org/10.1080/00016350410001685>
9. Köhler B, Andréen I, Jonsson B. The earlier the colonization by mutans streptococci, the higher the caries prevalence at 4 years of age [Internet]. Vol. 3, Oral Microbiology and Immunology. 1988. p. 14–7. Available from: <http://dx.doi.org/10.1111/j.1399-302x.1988.tb00598.x>
10. Verma S, Bansal K, Singhal S. Correlation between early childhood caries and maternal caries status and influence of preventive educational counseling on children's mutans levels [Internet]. Vol. 3, Universal Research Journal of Dentistry. 2013. p. 1. Available from: <http://dx.doi.org/10.4103/2249-9725.119042>
11. Berkowitz RJ, Jordan HV. Similarity of bacteriocins of Streptococcus mutans from mother and infant. Arch Oral Biol. 1975 Nov;20(11):725–30.
12. Inglehart MR, Bagramian R. Oral Health-related Quality of Life. Quintessence Publishing Company; 2002. 208 p.
13. Leal SC, Takeshita EM. Pediatric Restorative Dentistry. Springer; 2018. 228 p.
14. Mooney JB, Barrancos PJ. Operatoria Dental/ Dental Operation: Integracion Clinica/ Clinical Integration. Ed. Médica Panamericana; 2006. 1345 p.
15. Fejerskov O, Kidd E. Dental Caries: The Disease and Its Clinical Management. John Wiley & Sons; 2009. 640 p.
16. Dima S, Chang W-J, Chen J-W, Teng N-C. Early Childhood Caries-Related Knowledge, Attitude, and Practice: Discordance between Pediatricians and Dentists toward Medical Office-Based Prevention in Taiwan. Int J Environ Res Public Health [Internet]. 2018 May 24;15(6). Available from: <http://dx.doi.org/10.3390/ijerph15061067>
17. Schafer TE, Adair SM. PREVENTION OF DENTAL DISEASE [Internet]. Vol. 47, Pediatric Clinics of North America. 2000. p. 1021–42. Available from: [http://dx.doi.org/10.1016/s0031-3955\(05\)70256-x](http://dx.doi.org/10.1016/s0031-3955(05)70256-x)
18. Caufield PW, Griffen AL. DENTAL CARIES [Internet]. Vol. 47, Pediatric Clinics of North America. 2000. p. 1001–19. Available from: [http://dx.doi.org/10.1016/s0031-3955\(05\)70255-8](http://dx.doi.org/10.1016/s0031-3955(05)70255-8)
19. Berkowitz RJ, Turner J, Hughes C. Microbial characteristics of the human dental caries associated with prolonged bottle-feeding [Internet]. Vol. 29, Archives of Oral Biology. 1984. p. 949–51. Available from: [http://dx.doi.org/10.1016/0003-9969\(84\)90097-9](http://dx.doi.org/10.1016/0003-9969(84)90097-9)
20. Milnes AR, Bowden GHW. The Microflora Associated with Developing Lesions of Nursing Caries [Internet]. Vol. 19, Caries Research. 1985. p. 289–97. Available from: <http://dx.doi.org/10.1159/000260858>
21. Jin B-H, Ma D-S, Moon H-S, Paik D-I, Hahn S-H, Horowitz AM. Early childhood caries: prevalence and risk

- factors in Seoul, Korea. J Public Health Dent. 2003 Summer;63(3):183–8.
22. Weinstein P, Harrison R, Benton T. Motivating parents to prevent caries in their young children: one-year findings. J Am Dent Assoc. 2004 Jun;135(6):731–8.
23. Cruvinel VRN, Gravina DBL, Azevedo TDP, Bezerra ACB, de Toledo OA. Prevalence of dental caries and caries-related risk factors in premature and term children [Internet]. Vol. 24, Brazilian Oral Research. 2010. p. 329–35. Available from: <http://dx.doi.org/10.1590/s1806-83242010000300012>

FIGURES: -

SOCIAL DEMOGRAPHIC DATA :

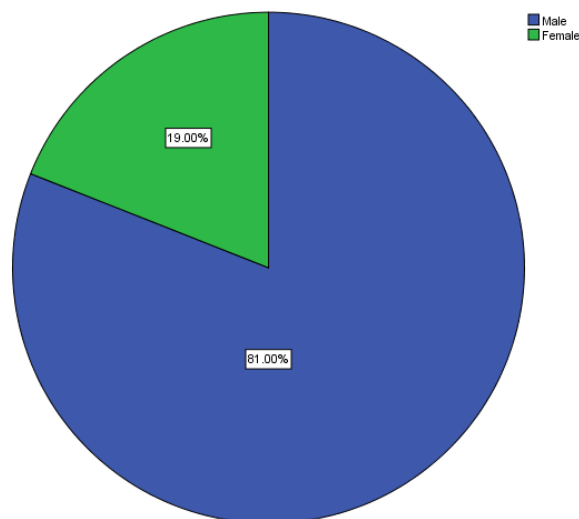


Figure 1 : Pie chart representing percentage distribution of gender of the participants . 81.00 % - male (blue) , 19.00 % - female (green) .

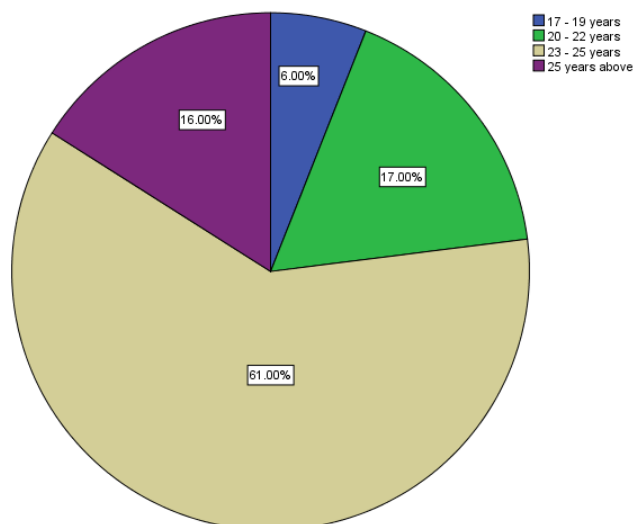


Figure 2 : Pie chart representing percentage distribution of age group of participants . 6.00 % - 17-19 years (blue) , 17.00 % - 20 -22 years (green) , 81.00 % - 23-25 years (brown) , 16.00- 25 years above (violet) .

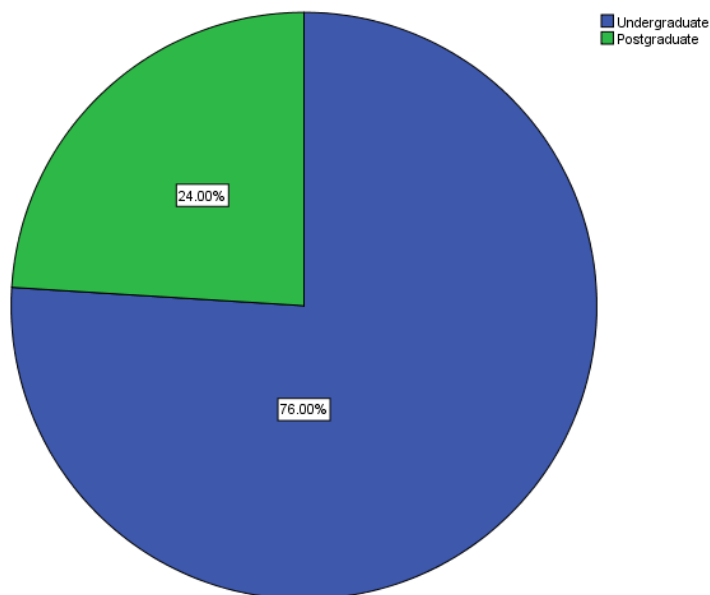


Figure 3 : Pie chart representing percentage distribution of graduations of participants , 76.00 % - undergraduate (blue) , 24.00 % - postgraduate (green) .

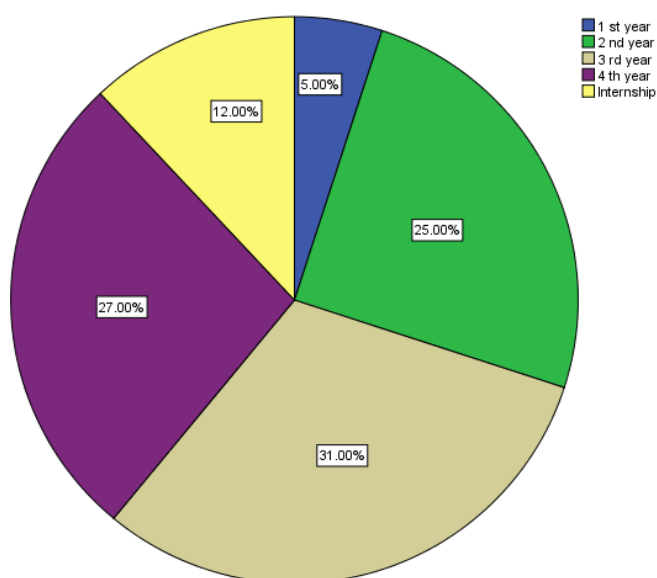


Figure 4 : Pie chart representing percentage distribution of year of participants , 5.00 % - 1 st year (blue) , 25.00 % - 2 nd year (green) , 31.00 % - 3 rd year (brown) , 27.00 % - 4 th year (violet) , 12.00 % - Internship (yellow) .

KNOWLEDGE AND ATTITUDE

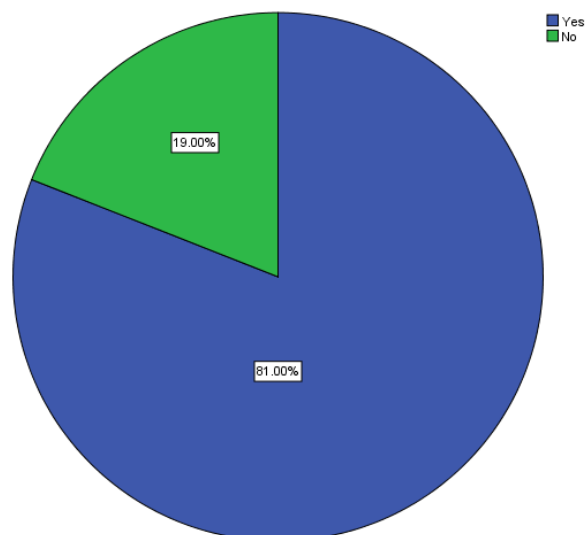


Figure 1 : Pie chart representing percentage distribution of responses about nursing bottle caries will affect the developing permanent tooth bud, 81.00 % - Yes (blue), 19.00 % - No (green).

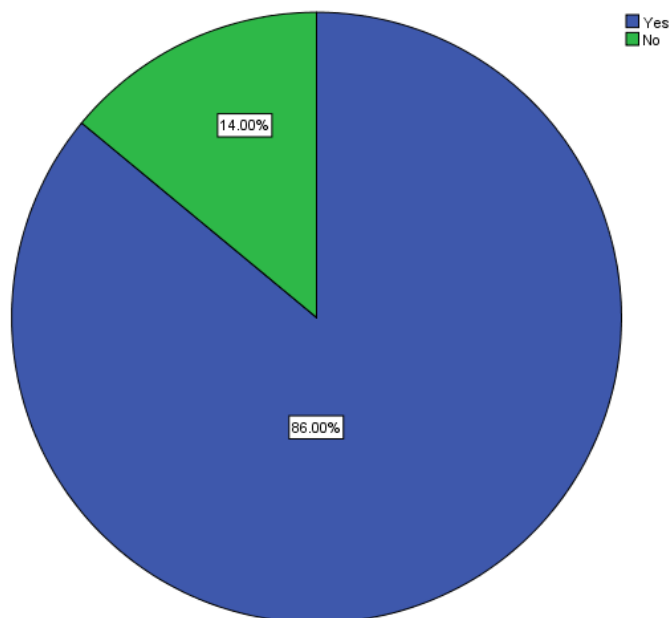


Figure 2 : Pie chart representing percentage distribution of responses about knowledge of nursing bottle caries, 86.00 % - Yes (blue), 14.00 % - No (green).

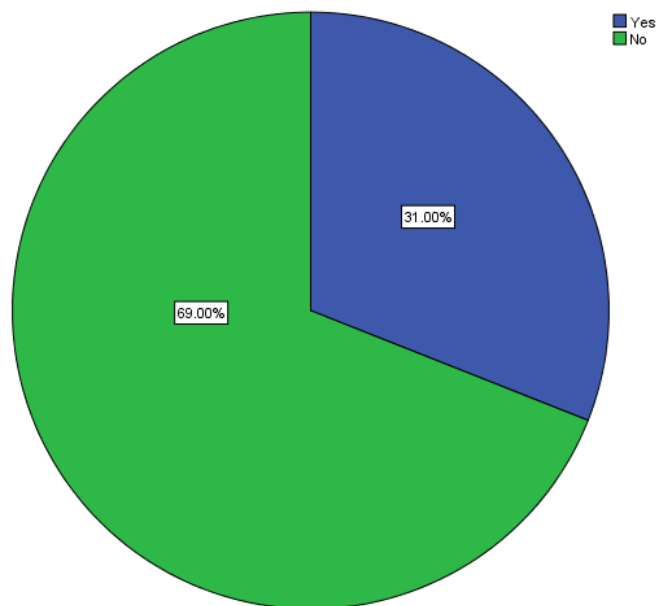


Figure 3 : Pie chart representing percentage distribution of responses about awareness on early childhood caries, 31.00 % - Yes (blue), 69.00 % - No (green).

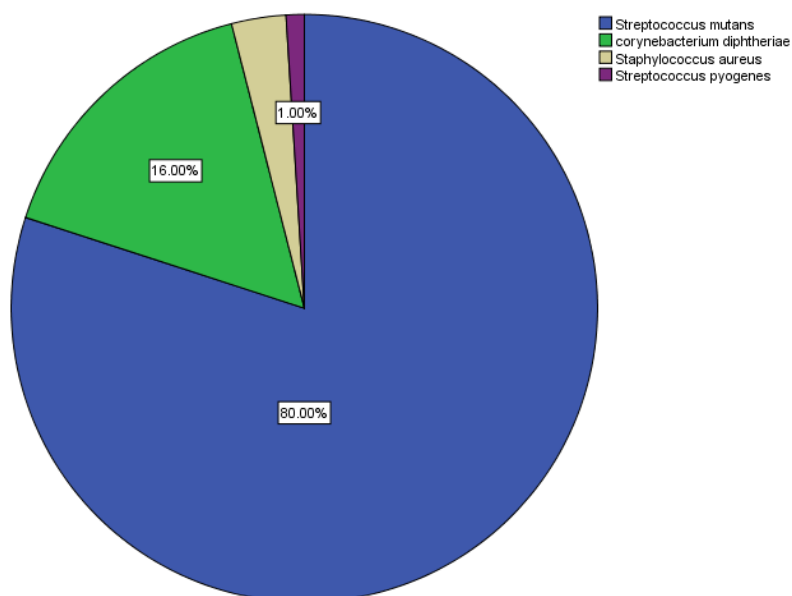


Figure 4 : Pie chart representing percentage distribution of responses about knowledge of organism mainly effected on nursing bottle caries, 80.00 % -streptococcus mutans (blue) , 16.00 % - corynebacterium diphtheria (green) , 1.00 % - staphylococcus aureus (brown) , 1.00 % - streptococcus pyrogens (violet) .

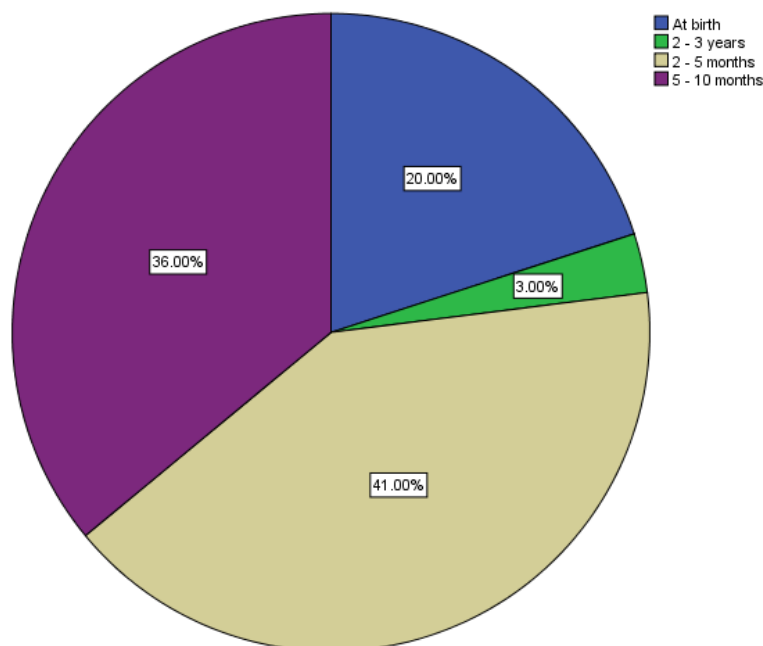


Figure 5 : Pie chart representing percentage distribution of responses about age group mostly affected by nursing bottle caries , 20.00 % - At birth (blue) , 3.00 % - 2-3 years (green) , 41.00 % - 2-5 years (brown) , 36.00 % - 5- 10 months (violet) .

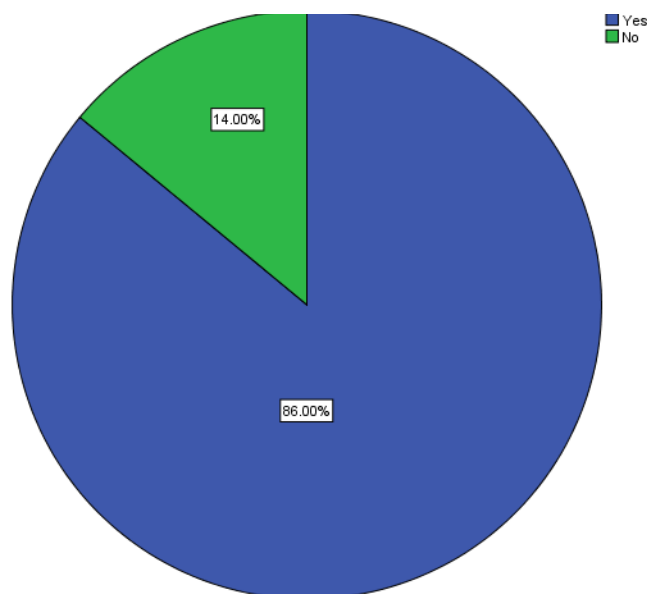


Figure 6 : Pie chart representing percentage distribution of responses about a treatment plan for nursing bottle caries - 86.00 % - Yes (blue) , 14.00 % - No (green) .

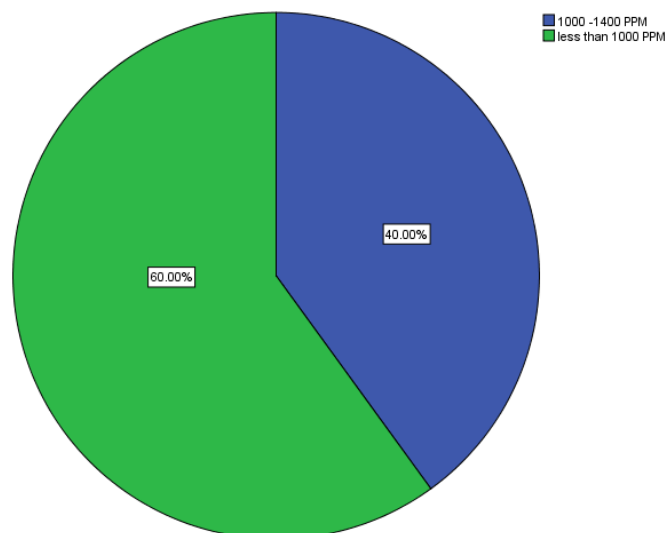


Figure 7 : Pie chart representing percentage distribution of responses about PPM fluoride recommended for infants or children, 40.00 % - 1000 - 1400 (blue) , 60.00 % - less than 1000 PPM (green) .

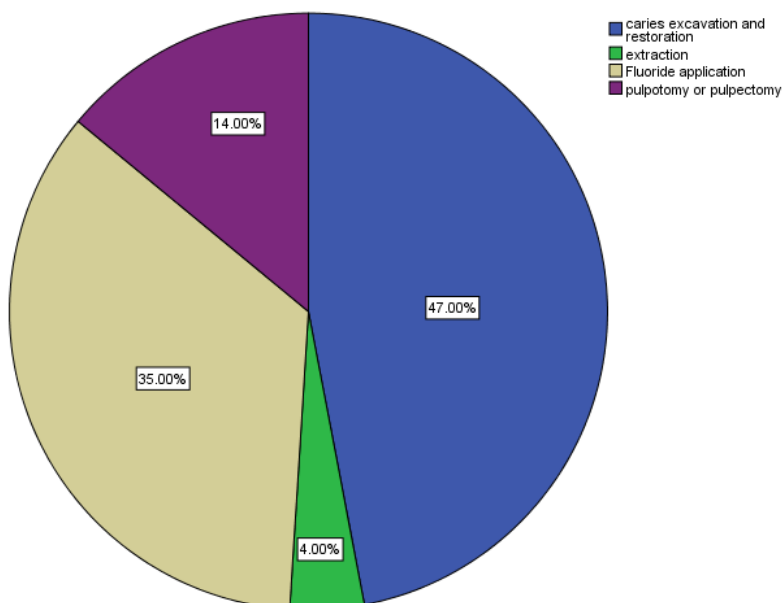


Figure 8 : Pie chart representing percentage distribution of responses about treatment nursing bottle caries , 47.00 % - carless excavation and restoration (blue) , 4.00 % - extraction (green) , 35.00 % - fluoride application (brown) , 14.00 % - pulpectomy or pulpectomy (violet) .

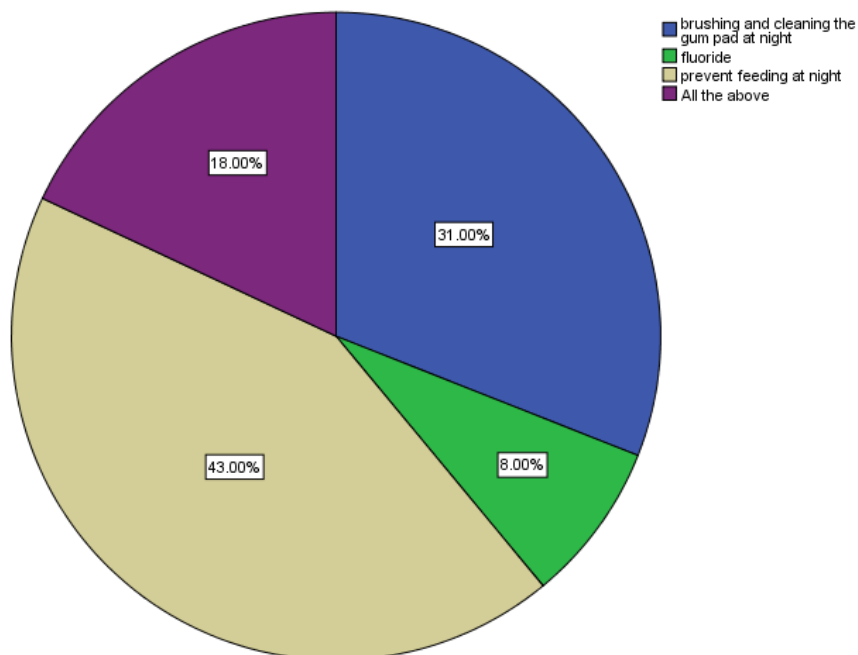


Figure 9 : Pie chart representing percentage distribution of responses about prevent nursing bottle caries , 31.00 % - brushing and cleaning the gum pad at night (blue) , 8.00 % - fluoride (green) , 43.00 % - prevents feeding at night (brown) , 18.00 % - all the above (violet)

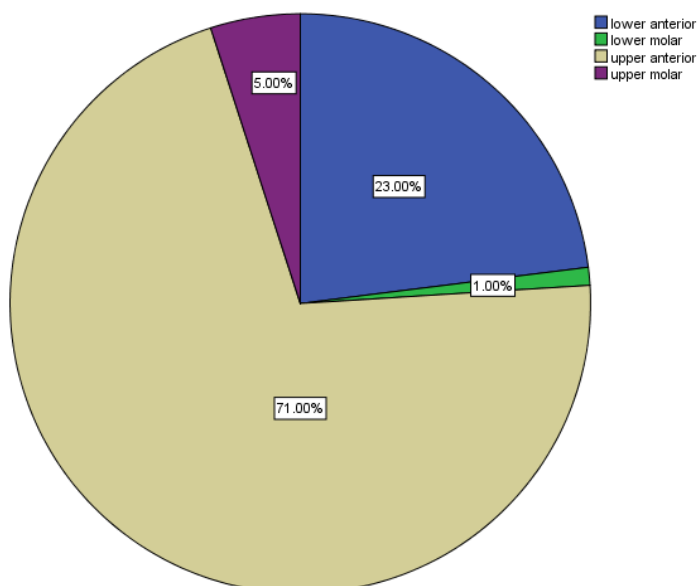


Figure 10 : Pie chart representing percentage distribution of responses about protected in early childhood caries, 23.00 % - lower anterior (blue) , 1.00 % - lower molar (green) , 71.00 % - upper anterior (brown) , 5.00 % - upper molar (violet) .

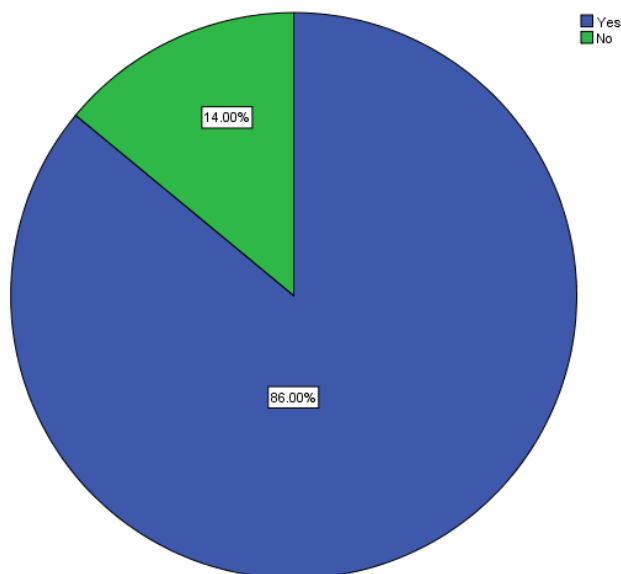


Figure 11: Pie chart representing percentage distribution of responses about procedure caries assessment, 86 % - Yes (blue), 14.0 % (green)

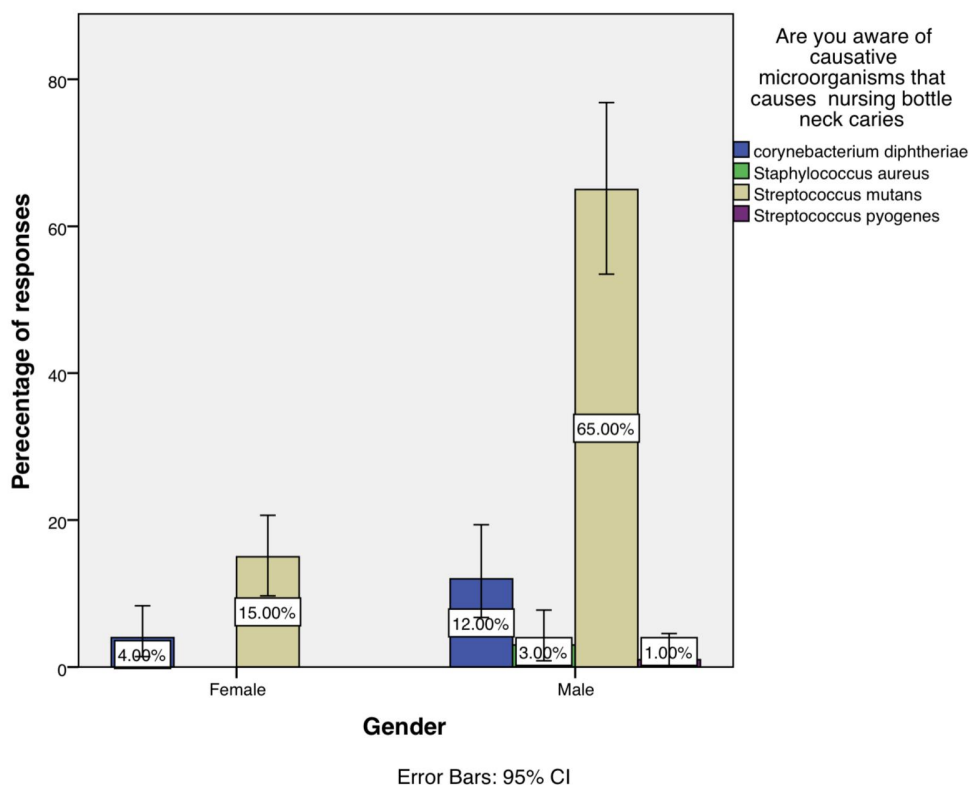


Figure 15: Bar graph showing the association between the graduation(X-axis) and responses to types of microorganism (Y-axis). 65.00 % of the undergraduate reported Streptococcus mutans and 15.00 % of the females reported streptococcus mutans. Blue denoted corynebacterium, green denoted staphylococcus aureus, brown denoted streptococcus mutans, and grey denoted streptococcus pyogenes. Chi-square test (Pearson Chi-square value = 2.961) $p = 0.525$ ($p > 0.005$ statistically not significant) .

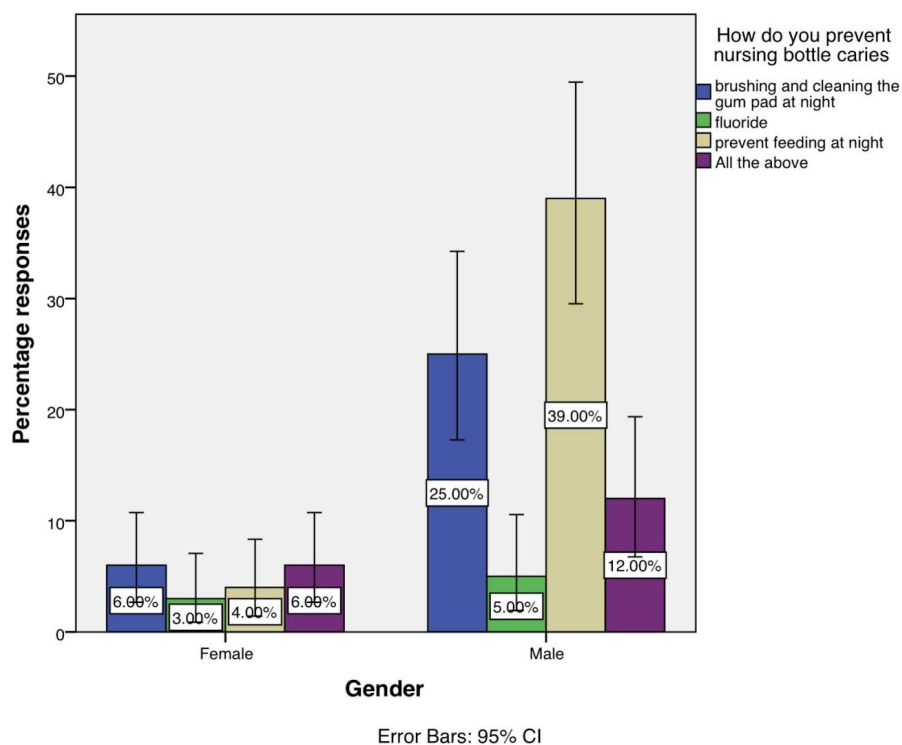


Figure 16: Bar graph showing an association between graduation (X-axis) and responses to prevention (Y-axis). 39.00 % of the undergraduate prevent feeding at night and 4.00 % of the postgraduate reported prevent feeding at night. Blue denoted brushing and cleaning the gum pad at night, green denoted fluoride, violet denoted all the above, and brown denoted prevent feeding at night. Chi-square test (Pearson Chi-square value = 0.979) $p = 0.525$ ($p > 0.005$ statistically not significant) .

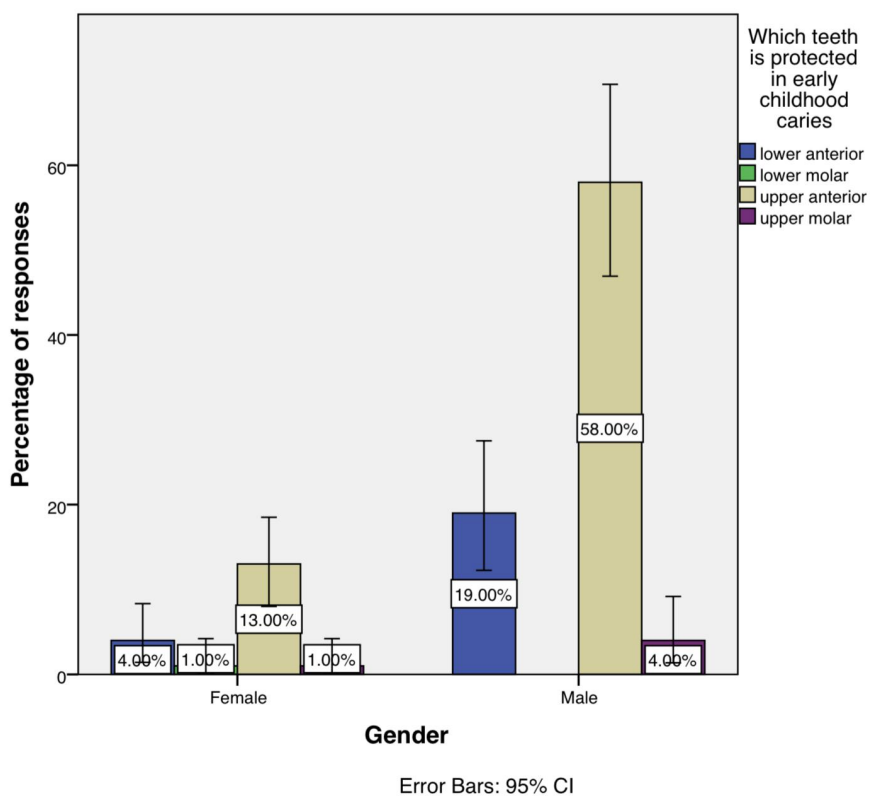


Figure 17 : Bar graph showing an association between the graduation (X-axis) and affected tooth (Y-axis). 58.00 % of the Undergraduate reported upper anterior and 13.00 % of the postgraduate reported upper anterior. Blue denoted lower anterior, green denoted lower molar, violet denoted upper anterior, and brown denoted upper anterior. Chi-square test (Pearson Chi-square value = 2.256) $p = 0.525$ ($p > 0.005$ statistically not significant) .