Gender differences in caries on isolated smooth surfaces vs isolated pit and fissure surfaces in the pediatric population age group: 2-5 years old: A retrospective Study

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Introduction

Dental caries remain a significant public health concern, particularly among pediatric populations aged 2-5 years old. Early childhood caries (ECC) can have lasting implications on oral health and overall well-being. Understanding the distribution and determinants of caries in this age group is essential for effective prevention and intervention strategies.

One area of interest is the potential gender differences in caries occurrence on isolated smooth surfaces versus isolated pit and fissure surfaces. While studies have investigated caries prevalence in young children, few have specifically examined the influence of gender on caries distribution across different tooth surface types.

By conducting a retrospective study, we aim to explore whether gender disparities exist in caries occurrence on smooth surfaces compared to pit and fissure surfaces in children aged 2-5 years old. Identifying such differences could provide valuable insights into the etiology and progression of dental caries in early childhood, ultimately informing targeted prevention efforts and treatment modalities.

Through meticulous data collection and rigorous statistical analysis, this study seeks to contribute to the existing literature on pediatric oral health and pave the way for tailored interventions aimed at reducing caries burden among young children.

Materials & Methods

Descriptive statistics were computed for all aims, including frequencies and proportions for categorical data, and median with interquartile range (Q1-Q3) for continuous data.

1. Data Collection: Dental charts of children aged 2-5 years will be reviewed to gather relevant information, such as gender, occurrence of caries, and surface type (smooth or pit/fissure).

2. Sampling Strategy: A systematic sampling method will be employed to select a representative sample of dental records within the specified age group from the study population.

3. Inclusion and Exclusion Criteria: Inclusion criteria will specify the age range (2-5 years) and the availability of complete data on relevant variables. Records with missing or incomplete information will be excluded.

4. Statistical Analysis: Descriptive statistics will summarize demographic characteristics of the sample. Comparative analyses, such as chi-square tests, will be utilized to assess gender-based differences in caries occurrence on different surfaces.

5. Ethical Considerations: Ethical guidelines will be strictly adhered to ensure patient confidentiality and the privacy of personal health information during data collection and analysis.

Table of Smooth Surface Caries by Gender

Gender	Smooth Surface Caries		
Frequency Percent Row Pct Col Pct	No Caries	Caries Present	Total
Female	79 40.72 83.16 47.88	16 8.25 16.84 55.17	95 48.97
Male	86 44.33 86.87 52.12	13 6.70 13.13 44.83	99 51.03
Total	165 85.05	29 14.95	194 100.00

Table of Pit and Fissure Surface Caries by Gender

Gender	Pit and fissure Surface Caries		
Frequency Percent Row Pct Col Pct	No Caries	Caries Present	Total
Female	57 29.38 60.00 50.44	38 19.59 40.00 46.91	95 48.97
Male	56 28.87 56.57 49.56	43 22.16 43.43 53.09	99 51.03
Total	113 58.25	81 41.75	194 100.00

Table of Smooth Surface VS Pit and Fissure Surface Findings

Smooth Surface Caries	Pit and Fissure Surface Caries		
Frequency Percent Row Pct Col Pct	Caries Present	No Caries	Total
Caries Present	27 13.92 93.10 33.33	2 1.03 6.90 1.77	29 14.95
No Caries	54 27.84 32.73 66.67	111 57.22 67.27 98.23	165 85.05
Total	81 41.75	113 58.25	194 100.00

Results

The initial dataset comprised of 200 patients. After excluding observations with missing data on smooth-surface caries (n = 5) and age less than 2 years (n = 1), the final sample size used for analyses was 194 observations.

The cohort consisted of 51% (n = 99) males and 49% (n = 95) females, with 33% (n = 64) aged 3 years, and an incidence of caries in 43% (n = 83) of the cohort.

Aim 1: The prevalence of caries overall among children aged 2-5 years was 42.8% (95% CI: 35.7% - 50.1%; n = 83). Smooth-surface caries prevalence was 15% (95% CI: 10.3% - 20.8%; n = 29), and pit/fissure caries prevalence was 41.8% (95% CI: 34.7% - 49%; n = 81).

Aim 2: Gender-based disparities in overall caries, smooth-surface caries, and pit/fissure caries were analyzed using the Chi-square test. There was no significant association between gender and overall caries (p = 0.85), smooth-surface caries (p = 0.47), or pit/fissure caries (p = 0.63). The association between smooth-surface caries and pit/fissure caries was significant (p<0.0001) overall and when stratified by gender (p<0.0001 for both males and females).

In the full cohort, 13.9% of subjects had both smooth-surface and pit/fissure caries. There was a significant association between smooth-surface caries and pit/fissure caries (p<0.0001) overall and stratified by gender (p<0.0001 for both males and females).

Key Findings:

- There was no significant association between gender and overall caries (p = 0.85).
- There was a significant association between smooth-surface caries and pit/fissure caries (p<0.0001) overall and stratified by gender (p-value for both males and females p<0.0001).
- Subjects had significantly more pit/fissure caries (41.8%) than smooth-surface caries (14.9%), p<0.0001.
- Female subjects had significantly more pit/fissure caries (40%) than smooth-surface caries (60%), p<0.0001.
- Male subjects had significantly more pit/fissure caries (43.3%) than smooth-surface caries (13.1%), p<0.0001.

Discussion

This study aimed to provide specific insights into caries occurrence patterns among children aged 2-5 years, a critical age group for dental health interventions. By addressing a gap in the literature through comparing caries occurrence on isolated smooth surfaces versus isolated pit and fissure surfaces, we shed light on potential differences in risk factors and preventive strategies associated with these surfaces.

Our findings contribute to the understanding of gender-based disparities in dental caries, which is essential for developing more tailored and effective preventive measures. While no significant association was found between gender and overall caries, a significant association was observed between smooth-surface caries and pit/fissure caries.

These results underscore the importance of considering different surface types when designing preventive strategies and interventions. Strategies targeting specific surface types may be more effective in reducing caries prevalence in young children. Furthermore, understanding gender-based disparities can help in identifying at-risk populations and implementing targeted interventions to address these disparities.

By enhancing the evidence base for pediatric oral healthcare strategies, this study facilitates the development of targeted interventions aimed at reducing caries prevalence and promoting better oral health outcomes in young children. Continued research in this area is crucial for refining preventive measures and improving oral health outcomes in pediatric populations.

References

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