

## INTISARI

Sindrom Down memiliki kondisi hipoplasia tulang maksila dengan palatum pendek dan sempit sehingga bentuk dan volume *cavum oris* lebih kecil. Volume *cavum oris* yang lebih kecil berhubungan dengan nilai frekuensi dan amplitudo fonem vokal /i/ dan /u/. Hal ini menjadikan perkembangan bahasa dan komunikasi kurang yang berdampak pada perkembangan pendidikan dan interaksi sosialnya. Tujuan penelitian ini adalah menganalisis hubungan volume *cavum oris* dengan nilai frekuensi dan amplitudo fonem vokal /i/ dan /u/ anak Sindrom Down.

Penelitian observasional dengan pendekatan *cross sectional* dilakukan pada 28 anak Sindrom Down di SLB Kota Yogyakarta yang memenuhi kriteria subyek penelitian. Perekaman fonem vokal /i/ dan /u/ dilakukan di SLB dalam ruang tertutup. Analisis nilai frekuensi dan amplitudo menggunakan software Praat. *Cavum oris* anak Sindrom Down dicetak dengan alat *intraoral scanner*. Pengukuran volume *cavum oris* menggunakan aplikasi *3Shape 3DViewer* dan *Inventor Profesional 2020*. Hubungan volume *cavum oris*, frekuensi, dan amplitudo dianalisis dengan uji korelasi *Pearson Product Moment*.

Hasil penelitian menunjukkan hubungan negatif dengan kekuatan sedang ( $r = -0,487$ ) antara volume *cavum oris* dan frekuensi fonem /u/ dengan nilai  $p = 0,009$  ( $p < 0,05$ ). Hubungan antara volume *cavum oris* dengan frekuensi /i/, amplitudo /i/, dan amplitudo /u/ tidak signifikan ( $p > 0,05$ ). Kesimpulan hasil penelitian adalah semakin kecil volume *cavum oris* maka semakin tinggi frekuensi fonem vokal /u/.

**Kata kunci:** volume *cavum oris*, Sindrom Down, frekuensi, amplitudo, fonem vokal /i/ dan /u/

## ABSTRACT

Down syndrome is characterized by maxillary hypoplasia with a short and narrow palate, resulting in a smaller oral cavity shape and volume. A smaller oral cavity volume is associated with a frequency and amplitude of phonemes /i/ and /u/. This results in a deficit of language and communication development which has an impact on educational development and social interaction. This study aims to analyze the relationship between the oral cavity volume and the frequency and amplitude of the phonemes /i/ and /u/ in children with Down syndrome.

An observational study with a cross-sectional approach was conducted on 28 children with Down Syndrome at SLB Yogyakarta who met the research subject criteria. Recordings of the vowel phonemes /i/ and /u/ were performed in an enclosed space at the school. Frequency and amplitude values were analyzed using Praat software. The oral cavity of a Down Syndrome is printed using an intraoral scanner. Measurement of oral cavity volume using 3Shape 3DViewer and Inventor Professional 2020. Correlation between oral cavity volume, frequency, and amplitude was analyzed using the Pearson Product Moment test.

The results of the study showed there was a negative correlation with moderate strength ( $r = -0.487$ ) between the oral cavity volume and the frequency of the phoneme /u/ with a value of  $p = 0.009$  ( $p < 0.05$ ). Correlation between the volume of the oral cavity and frequency of /i/, amplitude of /i/, and amplitude of /u/ no significant ( $p > 0.05$ ). The study concludes that the smaller oral cavity volume, the higher frequency of vowel phoneme /u/.

**Keywords:** oral cavity volume, Down syndrome, frequency, amplitude, vowel phonemes /i/ and /u/