

9th Congress of
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12-13 April, 2024



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THE IMPACT OF MOUTH BREATHING ON VOICE AERODYNAMICS AND ACOUSTIC PROPERTIES IN PRIMARY SCHOOL-AGED CHILDREN

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AIM(S) AND METHODS

- **Aims:** To find out the impact of mouth breathing on voice aerodynamic and acoustic properties in primary school-aged children
 - **Methods:** Two groups of primary school-aged children were formed – 20 children with and 20 without mouth breathing. The Maximum Phonation Time measurements were carried out to all participants. Each measurement was done three times. The vocal samples were recorded using Apple smartphone app Voice Memos. Voice acoustic analysis with program Praat v. 6.3.09 was provided with the purpose to determine Jitt, Shim and the first three formants (F1, F2, F3)
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SHORT INTRODUCTION

- Breathing plays a vital role in the overall well-being of a person (Arevalo & Weckx, 2005)
- Mouth breathing can cause many problems, such as postrure problems, an incorrect position of tongue, decreased cognitive performance and vocal folds mucosa dryness, which impacts voice aerodynamic, acoustic properties, and speech sound articulation (Alhazmi, 2022; Arevalo & Weckx, 2005; Lin, Zhao, Qin, Hua, & He, 2022; Sivasankar & Erickson-Levendoski, 2012)





SHORT INTRODUCTION

- The different forms of speech disturbances, such as articulation and voice disorders, are among the characteristics of mouth breathing that pose the most concern (Alhazmi, 2022)
- According to studies, mouth breathing impacts around 10–15 % of all children, however the prevalence varies depending on the region (Achmad & Ansar, 2021)



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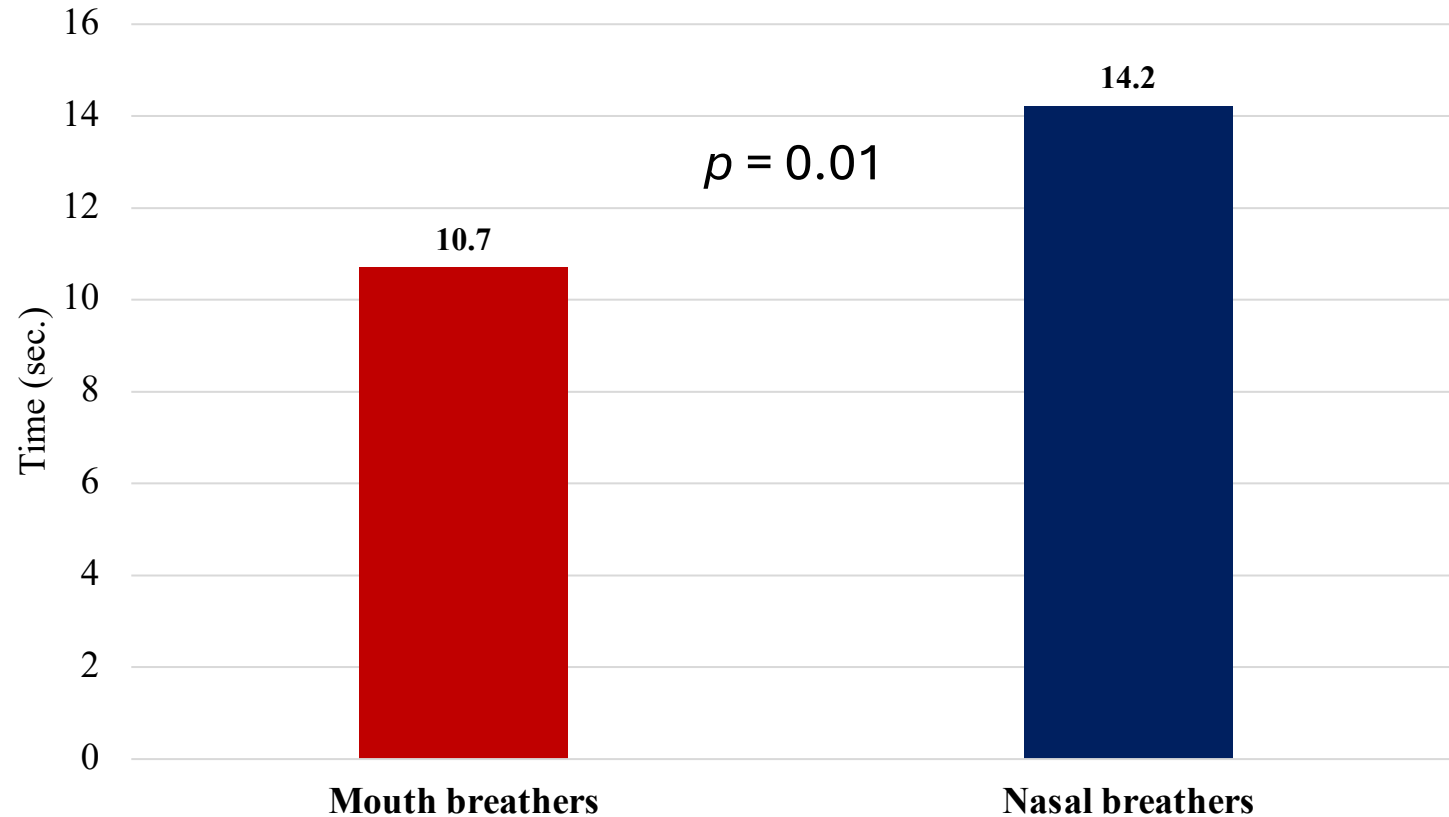
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- The results showed statistical significance in MPT measurements between both groups ($p = 0.01$)
- Mouth breathers' average MPT was 10.7 seconds, and nasal breathers' 14.2 seconds

RESULTS

Maximum Phonation Time in both groups



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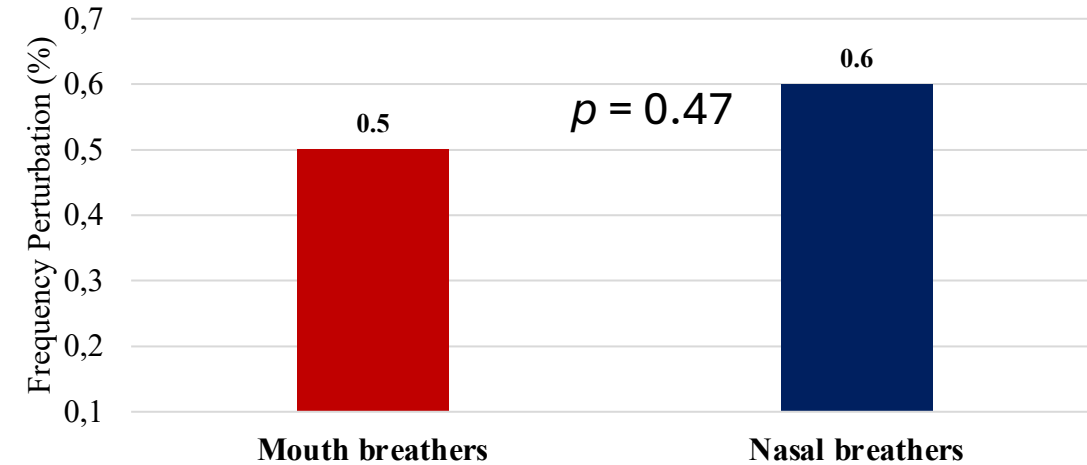
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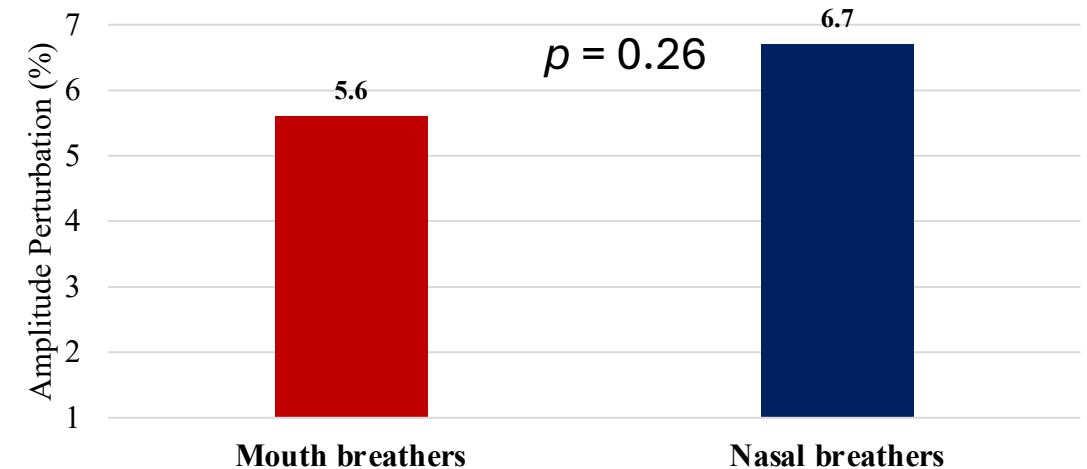
- The results showed no statistical significance in Jitt and Shim measurements ($p = 0.47$; $p = 0.26$)
- Mouth breathers' average Jitt was 0.5 %, but nasal breathers' – 0.6 %
- Mouth breathers' average Shim was 5.6 %, but nasal breathers' – 6.7 %

RESULTS

Jitt in both groups



Shim in both groups



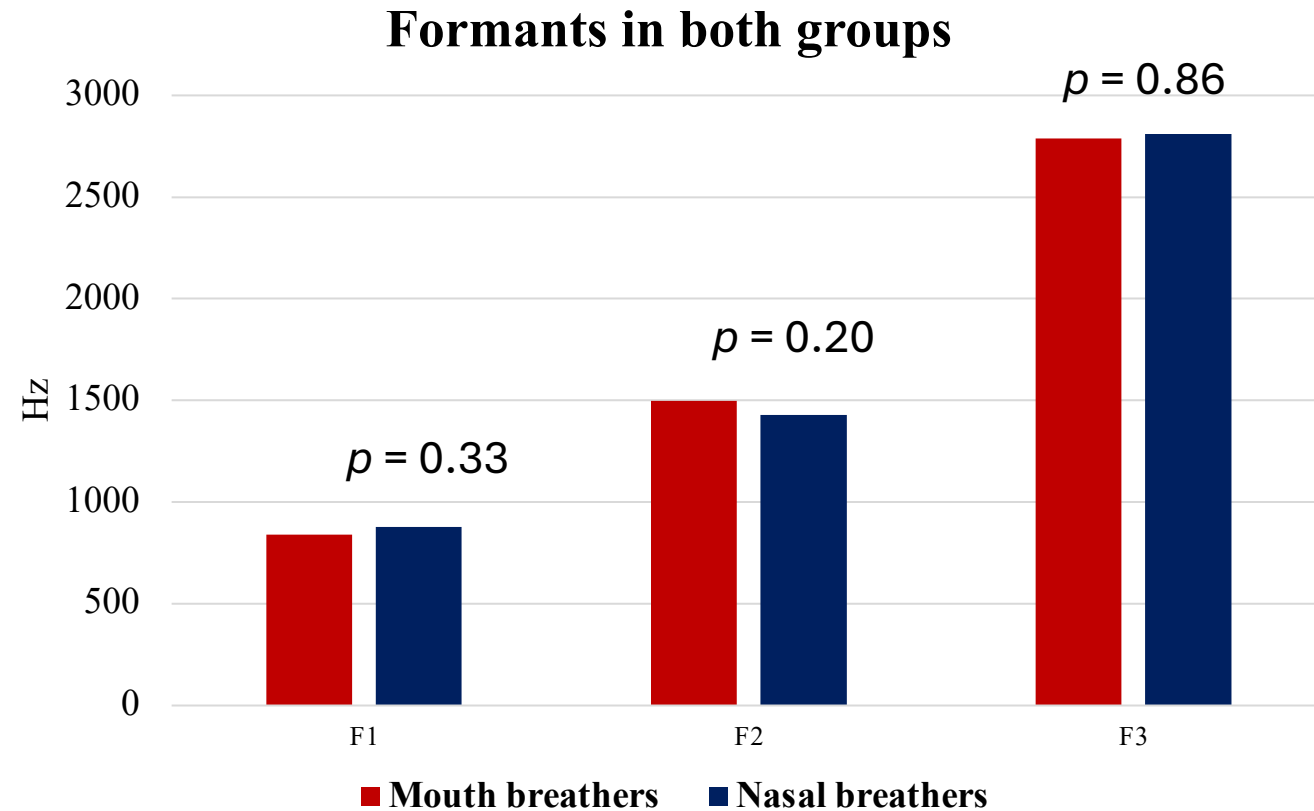
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- The results showed no statistical significance in first three (F1, F2, F3) formants measurements
- Mouth breathers' average F1 was 840 Hz, but nasal breathers' – 877 Hz
- Mouth breathers' average F2 was 1498 Hz, but nasal breathers' – 1428 Hz
- Mouth breathers' average F3 was 2788 Hz, but nasal breathers' – 2810 Hz

RESULTS





CONCLUSION

1. As statistical significance was observed in only one measurement (MPT), the proposed hypothesis “Mouth breathing in children of primary school age negatively affects the aerodynamic and acoustic properties of the voice” was partially confirmed.
2. There is a possibility that the data are not statistically significant, because the study has limitations – firstly, the number of children in the samples was small, secondly, the method for selecting respondents included an observation (not objective confirmation of nasal obstruction).



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