



Original Article

## The effects of tongue stretching exercise on tongue length in healthy adults: a preliminary study

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**Abstract.** [Purpose] The purpose of this study was to investigate the effects of tongue stretching exercise on the tongue length of healthy adults. [Subjects and Methods] This study recruited 6 healthy adults. They were treated for 4 weeks with tongue stretching. The change in tongue length during tongue protrusion before and after intervention was measured using a ruler. [Results] All 6 participants showed increased tongue length (minimum 20 mm to maximum 40 mm). [Conclusion] This study confirms that tongue stretching is a useful method to increase tongue length.

**Key words:** Tongue, Stretching, Swallowing

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### INTRODUCTION

The tongue is one of the structures that plays an important role in the normal swallowing mechanism. Therefore, maintaining proper tongue function is important for safe swallowing. With this in mind, the proper muscle strength and range of motion of the tongue are important for its adequate functioning in the oral phase. Park et al.<sup>1)</sup> have reported that tongue strength is closely related to the oropharyngeal swallow function. Moreover, the strength of the tongue can be maintained or increased through strength training, such as resistance exercise. Kim et al.<sup>2)</sup> have shown that tongue strength training is effective in improving swallowing as well as in increasing tongue strength. However, most reported studies have been conducted on tongue strength training. Therefore, there are few studies on interventions for increasing the range of motion of the tongue. This study investigated the effects of tongue stretching training on the length of the tongue during tongue protrusion in healthy adults.

### SUBJECTS AND METHODS

This study was conducted on 6 healthy adults (3 men, 3 women; age range, 21–25 years). The participants were all healthy volunteers with no reported neurologic or structural damage affecting their oropharyngeal swallowing functions. The study purpose was explained to the participants before enrollment, and informed consent for participation was obtained from all participants in accordance with the principles of the Declaration of Helsinki.

In this study, the tongue stretching method used was as follows: the participant was asked to sit comfortably in a chair and allow his or her tongue to protrude as much as possible. At this time, the intervenor used dry gauze to grasp the tongue tightly with both hands and pull. The pull intensity was painless, and the tongue was pulled to the end of the range in a way

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that the tongue could be stretched to the maximum. The intervention period was 4 weeks, 5 days a week, 30 times a day. The measurement site was measured from the center of upper lip to the tip of the tongue out of the lips during tongue protrusion<sup>3)</sup>.

## RESULTS

As a result of measuring the change in tongue length during tongue protrusion, participant 1's tongue length increased from 310 mm to 340 mm, participant 2's tongue length increased from 280 mm to 320 mm, participant 3's tongue length increased from 300 mm to 320 mm, participant 4's tongue length increased from 360 mm to 390 mm, participant 5's tongue length increased from 330 mm to 350 mm, and participant 6's tongue length increased from 250 mm to 270 mm.

## DISCUSSION

All participants in this study showed increased tongue length during tongue protrusion following the intervention of tongue stretching. Stretching is known to relieve muscular tension, stretch length, and relax<sup>4)</sup>. With regards to static stretching, the increased range of motion following a single exercise can be explained by a decrease in overall muscle-tendon stiffness<sup>5)</sup>. Flexibility, which refers to the ability of a muscle to elongate, is an important component of physical fitness, and has an intimate relation with muscle performance<sup>6)</sup>. It is believed that stretching can decrease muscle stiffness, induce an increase in Ca<sup>+</sup> within the neuromuscular junction, and promote sarcomerogenesis<sup>7, 8)</sup>. All these factors may collectively contribute to a possible enhancement in motor performance after stretching exercise. This theoretical evidence supports the results of this study. Thus, tongue stretching exercises can increase range of motion and motor performance, and tongue stretching exercises can help patients with dysphagia.

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