Effectiveness of a Dietary Education Support Program Aimed at Improving Masticatory Ability and Handgrip Strength — A Randomized Controlled Trial

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Abstract: This study examined the effectiveness of a dietary education support program (DESP) aimed at improving masticatory ability and handgrip strength.

In this study, subjects were students from a public high school who consented to participation. Subjects were randomly divided into a group receiving DESP and a control group not receiving DESP. Both groups received health guidance from a dental hygienist prior to the initiation of the trial. The subjects in DESP ate chewy donuts containing soymilk and soy pulp to which liquid konjak had been added (trade name: “Chewin’ Donuts” Kekkou Kamigotae-aru Donatsu® manufactured by Shiraho Tanpaku Co., Ltd.). Subjects in this group were instructed to masticate consciously and ingest one donut per day for 7 consecutive days. The masticatory ability and handgrip strength of the left and right hands were measured in both groups at the beginning and end of the trial, and the mean values were calculated. The amount of sugar elution from chewing gum was measured to evaluate the direct masticatory ability. The occlusal contact area, mean and maximum occlusal pressures, and occlusal force were also measured with Dental Prescale® 50H Type R to compare indirect masticatory abilities before the trial with those after the trial.

As a result, in the group of 33 (17 males, 16 females) receiving DESP, the amount of sugar elution increased significantly for females from 53.7±9.4 to 58.4±5.5% and the occlusal contact area and occlusal force improved significantly for both males and females in the DESP group. The mean grip strength at the end of the trial in the DESP group improved significantly for males from 39.8±7.1 to 42.2±7.7 kg and for females from 22.9±3.9 to 24.7±3.4 kg. In the control group of 37 (17 males, 20 females) who did not receive DESP, the amount of sugar elution for males decreased significantly from 60.0±5.1 to 57.9±5.6% and mean grip strength for both males and females showed no significant difference.

This study suggests that DESP is effective in improving the masticatory ability and grip strength among high school students.


Key words: Masticatory ability, Handgrip strength, Dietary education support program, Randomized controlled trial, High school student

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