A Pilot Study of the Stiffness Discrimination Practice System Used for Novice Acupressure Massage Therapy

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I. Introduction

Licensed acupressure massage therapists can identify tender points or indurated areas that are harder than the surrounding area through palpation. The schools for the blind in Japan teach acupressure massage therapy to people with visual impairments. Teachers in the schools face the problem of a lack of material to practice stiffness discrimination, which is necessary for teaching acupressure skills to students with visual impairments. In this study, we developed a stiffness discrimination practice system that enables students with visual impairments to practice stiffness discrimination.

II. Method

For the fabrication of physical stiffness-controlled objects regarding the materials to practice stiffness discrimination, we used a specific technique to fabricate elastic objects of arbitrary hardness, which was established by a previous study [1]. In previous research [2], the relationship between the stiffness of the center of elastic objects was pressed into the index finger (Young's modulus), and the sensation of stiffness was clarified using these elastic objects. The eight elastic objects that fit into one of seven stiffness categories—"extremely soft," "fairly soft," "slightly soft," "neither," "slightly hard," "fairly hard," and "extremely hard"—were created in this experiment.

We prototyped a stiffness discrimination practice system with eight differently stiffened objects mounted on each of the devices (Fig. 1). Specifically, we prototyped a stiffness discrimination learning system that enables students with visual impairments to identify the stiffness of eight elastic objects belonging to different degrees of stiffness by voice. Acupressure massage therapists need to learn the skill to identify the differences in stiffness from the surface of the skin to the depth of the skin without stimulating any sense of pain in patients as much as possible. Thus, we could provide information on the pressure applied to elastic objects in terms of the difference in sound volume. The pressure values were converted to 10 levels of volume and transmitted to the computer using ZigBee, a 2.4 GHz wireless communication standard, to ensure that the audio file corresponding to each device can play back with volume changes.

We asked three teachers from the school for the blind involved in the training of acupressure massage therapists to use this prototype for three minutes. Although we wanted to increase the number of participants, the number of them was limited in consideration of the workload and busy schedule of each teacher. These evaluations were conducted with the permission of the Ethics Committee of the National Institute for Special Education Research.

III. Results and Discussions

This prototype was rated useful by all three participants. The function that produces different sounds depending on the stiffness of the elastic objects was commented to be necessary for students with visual impairments. Based on the results of this study, we plan to make improvements, such as making the shape of each device more compact, in our future work. We also think it is necessary to increase the number of participants and conduct a more detailed survey.

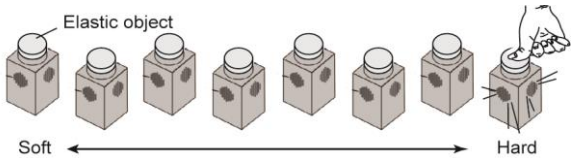

Fig. 1 Stiffness discrimination practice system

References

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